



NORTH SHORE TO CHANNEL FORCE MAIN PROJECT

Preliminary Mitigated Negative Declaration

Prepared for
San Francisco Planning Department

February 29, 2012

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Preliminary Mitigated Negative Declaration

Date: February 29, 2012
Case No.: 2011.1370E
Project Title: North Shore to Channel Force Main Project
Project Address: Portions of The Embarcadero, Jackson, Drumm, Spear, and Howard Streets and the pedestrian plaza at Market and Drumm Street, San Francisco, in public right-of-way and City sewer easement
Zoning: High-density residential-commercial (easement), remainder in public right-of-way
Block/Lot: Block 201, Lot 012 (easement), remainder in public right-of-way
Project Site Size: 3,300 linear feet
Project Sponsor: San Francisco Public Utilities Commission
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PROJECT DESCRIPTION:

The San Francisco Public Utilities Commission (SFPUC) is proposing to implement the North Shore to Channel Force Main Project (project or proposed project) in the financial district and south of Market areas of San Francisco to provide redundancy for a failing portion of the existing North Shore Force Main, and thereby prevent potential discharge of untreated wastewater into the San Francisco Bay. The proposed project consists of construction of a new 3,300-foot-long force main (referred to as the North Shore to Channel Force Main), installation of two underground vaults for flow control at the northern terminus of the new force main, and replacement/relocation of approximately 2,070 feet of water mains. The project would be implemented within San Francisco street rights-of-way, except for a portion of the segment beneath the former Jackson Street right-of-way, which is partially within an existing City sewer easement and partially within City property.

The existing North Shore Force Main is a 7,816-foot-long, 36-inch-outside-diameter force main that transports dry-weather flows and some wet-weather flows from the North Shore Basin to the Southeast Water Pollution Control Plant via the Channel Transport/Storage Box and Channel Pump Station located in China Basin. The proposed new section of the force main would have about the same capacity as the existing force main and would begin at the former intersection of Jackson Street and The Embarcadero, travel west under the former Jackson Street right-of-way to Drumm Street, south under Drumm Street to California Street, east under the Market Street pedestrian plaza, southeast under Market Street, southeast under Spear Street to Howard Street, and then continue northeast under Howard Street to the intersection with Steuart Street. Open-cut

excavation would be used for the majority of the alignment. Trenchless construction techniques, which involve the installation of underground infrastructure with minimal disruption to surface traffic, business, and other activities, would be used for the sewer line segments beneath the former Jackson Street right-of-way and at all intersections (along Drumm Street and Spear Street, and the Market Street and Spear Street intersection). Water main replacement work on Drumm Street would use open cut excavation across intersections.

Both underground vaults would be located near the former intersection of Jackson Street and The Embarcadero at the northern terminus of the proposed new force main. One vault would be located near the former intersection of Jackson Street and The Embarcadero and partially within the sidewalk, and the second vault would be located completely within The Embarcadero sidewalk. The SFPUC would relocate the existing 8- and 12-inch-diameter water mains along Spear Street between Market and Howard Streets to the opposite side of the street to make room for the proposed new force main, and water mains would also be replaced along Drumm Street.

Construction of the majority of the proposed project is expected to last approximately 14 months, from May 2012 through June 2013, and construction of one vault, located adjacent to The Embarcadero could occur later in 2013. Construction activities would generally occur Monday through Friday, from 9:00 am to 4:00 pm but in some cases from 7:00 a.m. to 6:00 p.m. No construction activities would occur on the City blocks within the San Francisco holiday construction moratorium, which is between Thanksgiving and New Year's (November 22, 2012 through January 1, 2013). Construction activities would be coordinated with the 34th America's Cup (AC34) events such that no construction work would occur along The Embarcadero during 2012 pre-race AC34 events (August 11, 2012 through September 2, 2012) and no construction activities would occur during the 2013 main race events (July 4, 2013 through September 22, 2013). To avoid conflicts with San Francisco Municipal Transportation Agency (Muni) Trolley Coach Lines No. 1 (California) and No. 41 (Union), work along Drumm Street between California and Sacramento Streets would be restricted to the weekends between 9:00 a.m. and 6:00 p.m., when these bus lines do not operate on this block. The contractor may elect to perform 24-hour construction for some of the work, including: a) up to five weeks for construction of temporary decking over a portion of The Embarcadero for Vault No. 1 construction; b) up to six days (non-consecutive) for Vault No. 1 construction and tie-in to existing force main; and c) up to two days (non-consecutive) for Vault No. 2 construction and tie-in to the existing force main.

FINDING:

This project would not have a significant effect on the environment. This finding is based on the criteria of the Guidelines of the State Secretary for Resources, Section 15064 (Determining the Significance of Environmental Effects), Section 15065 (Mandatory Findings of Significance), and Section 15070 (Decision to Prepare a Negative or Mitigated Negative Declaration), and on the results of the Initial Evaluation (Initial Study) for the project, which is attached.

Mitigation Measures are included in this project to avoid potentially significant effects, see Section E, Summary of Environmental Effects.

cc: Karen Frye, San Francisco Public Utilities Commission
Distribution List
Master Decision File/ Bulletin Board

INITIAL STUDY

North Shore to Channel Force Main Project Planning Department Case Number 2011.1370E

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List of Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ABAG	Association of Bay Area Governments
AC34	The 34th America's Cup Races
ADRP	archeological data recovery plan
AGMP	Archeo GIS Maritime Project
AMP	archeological monitoring program
ATP	archeological testing program
AWSS	SFPUC Auxiliary Water Supply System
BAAQMD	Bay Area Air Quality Management District
BAOS	Bay Area Ozone Strategy
BART	Bay Area Rapid Transit District
BCDC	San Francisco Bay Conservation and Development Commission
BP	before present
C-APE	CEQA Area of Potential Effects
Cal/OSHA	California Division of Occupational Safety and Health
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CDC	California Department of Conservation
CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CH ₄	methane
CMS	Changeable Message Signs
CNDDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CO ₂ E	carbon dioxide-equivalent
CRHR	California Register of Historical Resources
CSO	combined sewer overflow
cy	cubic yards
dB	decibel
dBA	decibel, A-weighted
DBI	San Francisco Department of Building Inspection
DPM	diesel particulate matter
DPT	San Francisco Municipal Transportation Agency Department of Parking and Traffic
DTSC	California Department of Toxic Substances Control
ESL	Environmental Screening Level
ERO	environmental review officer
FARR	Final Archeological Resources Report

FIRM	flood insurance rate map
FRP	fiberglass reinforced thermosetting plastic
FTA	Federal Transit Administration
g	peak ground acceleration
GHG	greenhouse gas
GIS	geographic information systems
HDPE	high-density polyethylene
HI	hazard index
HRA	health risk assessment
in/sec	inches per second
Ldn	day-night noise level
Leq	Equivalent Energy Noise Level
LF	linear feet
Lmax	maximum noise levels
LUST	leaking underground storage tank
MBTA	US Migratory Bird Treaty Act
MEI	maximally exposed individual
mgd	million gallons per day
mg/kg	milligram per kilogram
mg/L	milligrams per liter
MLD	most likely descendant
MMTCO ₂ E	metric tons of carbon dioxide-equivalent
MPO	Metropolitan Planning Organization
MRZ	mineral resource zone
MSL	mean sea level
Muni	San Francisco Municipal Transportation Agency
Mw	Moment magnitude
N ₂ O	Nitrous oxide
NAHC	Native American Heritage Commission
NOAA	National Oceanic and Atmospheric Administration
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NWIC	Northwest Information Center
OEHHA	California Office of Environmental Health and Hazard Assessment
OPR	California Office of Planning and Research
OSHA	Occupational Safety and Health Administration
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PGA	peak ground acceleration
PG&E	Pacific Gas and Electric Company
Port	Port of San Francisco
PPV	peak particle velocity
RCRA	US Resource Conservation and Recovery Act
ROG	reactive organic gas

RTP	regional transportation plan
RWQCB	San Francisco Bay Regional Water Quality Control Board
SB	Senate Bill
SEWPCP	Southeast Water Pollution Control Plant
SFBAAB	San Francisco Bay Area Air Basin
SFDPH	San Francisco Department of Public Health
SFDPT	San Francisco Department of Parking and Traffic
SFDPW	San Francisco Department of Public Works
SFFD	San Francisco Fire Department
SFMTA	San Francisco Municipal Transportation Agency
SFPD	San Francisco Police Department
SFPUC	San Francisco Public Utilities Commission
SOMA	South of Market neighborhood in San Francisco
STLC	soluble threshold limit concentration
TAC	toxic air contaminant
TASC	Transportation Advisory Staff Committee
TCLP	toxicity characteristic leaching procedure
TTLC	total threshold limit concentration
TPH-d	total petroleum hydrocarbons as diesel
TPH-g	total petroleum hydrocarbons as gasoline
USA North	Underground Service Alert
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VECD	verified emissions control devices
WLUP	Waterfront Land Use Plan

Glossary

100-year flood – A flood that has a 1-percent chance of being equaled or exceeded in any given year.

Ambient Noise Level – The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

A-weighted decibel (dBA) – Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called “A-weighting,” expressed as “dBA.” The dBA, or A-weighted decibel, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies.

Blind flange - A flange used to close the end of a pipe.

California Environmental Quality Act (CEQA) – Regulations set forth in California Public Resources Code Sections 21000-21178 that requires public agencies to identify and minimize significant environmental effects of a project.

Capacity – Engineering term for describing volume storage of structures or amount of flow inside structures. There are multiple uses of the term. This document uses the term “design capacity,” which is the maximum capacity or flow rate that a treatment facility or transmission system component is designed to operate under a specified set of regulatory criteria, engineering standards, or other engineering assumptions.

Cathodic protection – A method to control the corrosion of a metal surface by placing another more easily corroded metal nearby, usually galvanic anodes which are more active than steel. This practice is referred to as a sacrificial system, since the anodes sacrifice themselves to protect the steel or pipeline from corrosion.

Channel – A natural or artificial watercourse with a defined bed and banks to confine and convey continuously or periodically flowing water.

Community Noise Equivalent Level (CNEL) – Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to “quiet time” noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA “penalty” during the evening hours (7:00 p.m. to 10:00 p.m.) and a 10-dBA penalty during the night hours (10:00 p.m. to 7:00 a.m.).

Cultural resource – A fragile and nonrenewable remain of human activity that is valued by or significantly representative of a culture or that contains significant information about a culture. Cultural resources encompass archaeological, traditional, and built environment resources, including landscapes or districts, sites, buildings, structures, objects, or cultural practices that are usually greater than 50 years of age and possess architectural, historic, scientific, or other technical value.

Cumulatively considerable – A CEQA term that refers to two or more individual effects, which when considered together, are considerable or which compound or increase other environmental impacts.

Decibel (dB) – A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

Day-night noise level (Ldn) – Another 24-hour noise descriptor, called the day-night noise level (Ldn), is similar to CNEL. While both add a 10-dBA penalty to all nighttime noise events between 10:00 p.m. and 7:00 a.m., Ldn does not add the evening 5-dBA penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources.

Dewatering – The process of removing water from a pipeline for repair and maintenance or for removing groundwater from a trench during construction.

Discharge – The flow of surface water in a stream or canal or the outflow of groundwater from a flowing artesian well, ditch, or spring. Also refers to the discharge of liquid effluent from a facility, or to chemical emissions into the air through designated venting mechanisms.

Endangered species – Any species or subspecies of bird, mammal, fish, amphibian, reptile, or plant that is in serious danger of becoming extinct throughout all or a significant portion of its range. Federally endangered species are officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service and published in the Federal Register. Species may also be listed under the California Endangered Species Act by the Department of Fish and Game.

Environmental cases – Sites suspected of releasing hazardous substances or that have had cause for hazardous materials investigations and are identified on regulatory agency lists. These are sites where soil and/or groundwater contamination is known or suspected to have occurred.

Equivalent Noise Level (Leq) – The steady-state energy level that represents the acoustical energy of a given measurement.

Flow – The volume of liquid passing a given point per unit of time.

Force main – A pressurized main pipe in which flows are pumped rather than gravity driven.

Fugitive dust – Emissions that are released to the atmosphere by some means other than through a stack or tailpipe.

Greenhouse gas – A gas that contributes to the greenhouse effect by absorbing or trapping energy that is radiating from the Earth's surface and therefore contributing to global climate change. Some examples of greenhouse gases are carbon dioxide, methane, ozone, nitrous oxide and water vapor.

Habitat – The specific area or environment in which a particular type of animal or plant lives.

Hazardous materials – Defined in Section 25501(h) of the California Health and Safety Code, are materials that, because of their quantity, concentration, or physical or chemical characteristics, pose a substantial present or potential hazard to human health and safety or to the environment if released to the workplace or environment. Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

Hazardous waste – Any material that is relinquished, recycled, or inherently waste-like. Title 22 of the California Code of Regulations, Division 4.5, Chapter 11 contains regulations for the classification of hazardous wastes. A waste is considered a hazardous waste if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3. Article 4 lists specific hazardous wastes, and Article 5 identifies specific waste categories, including Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, and special wastes.

High-density polyethylene (HDPE) – A polyethylene thermoplastic made from petroleum. HDPE is commonly used to make products such as milk bottles, pipes and shopping bags.

Jet grouting – A process used to inject grout into the ground. A drill rod equipped with jet nozzles injects high-pressure water, air, and cement into the ground as the drill rod is rotated and raised. The high-pressure materials cut/loosen a circular column of soil. The soil is thereby mixed with cement material, increasing the strength and lowering the permeability of the soil.

Landmark trees – Large, old or historically important trees that receive designation and protection on a local basis (San Francisco Urban Forestry Ordinance, Public Works Code Article 16, Section 810, Board of Supervisors Resolution Number 440-06, File Number 060487, as amended).

Lead agency – The public agency that has the principal responsibility for carrying out or approving a project that is subject to CEQA. The Lead Agency is responsible for determining the appropriate environmental document, as well as its preparation.

Leq – Time variations in noise exposure are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement. Leq (24) is the steady-state energy level measured over a 24-hour period.

Lmax – A sound level that represents the maximum noise level measured during the measurement.

Level of service – A qualitative description of a transportation facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service range from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

Market Street pedestrian plaza – The brick sidewalk area along the project alignment that is generally in the vicinity bound by the intersection of California and Drumm Streets and the intersection of Market and Spear Streets, where the alignment is located between the Hyatt Regency Hotel and the California Cable Car turnaround.

Mitigation – The CEQA Guidelines Section 15370 defines mitigation as one or all of the following: (1) avoiding an impact altogether by not taking a certain action or parts of an action; (2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; (3) rectifying an impact by repairing, rehabilitating, or restoring the affected environment; (4) reducing or eliminating an impact over time by preservation and maintenance operations during the life of an action; and (5) compensating for an impact by replacing or providing substitute resources or environments.

North Shore Force Main - The existing North Shore Force Main (also known as the North Shore Pump Station (NSS) to Channel Box Force Main) is a 7,816-foot-long, 36-inch-outside-diameter force main that transports dry-weather flows and some wet-weather flows from the North Shore Basin to the Southeast Water Pollution Control Plant via the Channel Transport/Storage Box and Channel Pump Station located in China Basin.

North Shore to Channel Force Main – The proposed 3,300-foot-long North Shore to Channel Force Main would provide redundancy to a 2,770-foot segment of the existing North Shore Force Main that is susceptible to failure.

Peak-Period Lane. A third southbound lane on The Embarcadero between Broadway and Mission Street available on weekdays during the morning and evening commuter peak traffic periods of 7:00 to 9:00 a.m. and 3:00 to 6:00 p.m., respectively.

Peak particle velocity (PPV) – To assess the potential for structural damage associated with vibration, the vibratory ground motion in the vicinity of the affected structure is measured in terms of peak particle velocity (PPV) in the vertical and horizontal directions (vector sum), typically in units of inches per second (in/sec).

Pipe ramming – A trenchless method for installation of steel pipes and casings, especially under railway and roadways.

Primary treatment – This level of wastewater treatment removes floating and settleable solids by physical separating pollutants from the water stream. Such physical separation methods may include screening and sedimentation tanks.

Right-of-way – The area of land (usually a strip) acquired for and devoted to the provision of utilities.

Secant Pile Walls – These walls are formed by constructing intersecting reinforced concrete piles. The piles are reinforced with either steel rebar or with steel beams and are constructed by either drilling under mud or augering. Primary piles are installed first with secondary piles constructed in between the primary piles once the latter gain sufficient strength.

Secondary treatment – This level of wastewater treatment involves the removal of organic matter from wastewater or sewage using biological and chemical processes, and is more rigorous than primary treatment defined above. Secondary treatment is less intensive than tertiary treatment, which employs further chemical and biological processes to remove additional compounds in an effort to achieve discharge or reuse requirements.

Sedimentation – The deposition of material suspended in a stream system, whether in suspension (suspended load) or on the bottom (bedload).

Sensitive receptors – A land use or set of users that are sensitive or more vulnerable to the effects of noise, air quality, or a specific impact, than the surrounding uses or general population.

Special-status species – Several species known to occur within the general region of the program area are accorded “special status” because of their recognized rarity or vulnerability to habitat loss or population decline. Some of these species receive specific protection in federal and/or state endangered

species legislation. Others have been designated as “sensitive species” or “species of special concern” on the basis of adopted policies of federal, state, or local resource agencies. These species are referred to collectively as “special-status species.”

Spoil – Excess soil from excavations.

Subsidence – The lowering, settling or sinking of the land surface.

Tee-off – A point from which a pipe is fitted and joined in the form of a letter T.

Vault No. 1– This is a new valve-vault to be constructed as part of the project, located near the former intersection of Jackson Street and The Embarcadero and north of the existing Jackson Street Transport Structure (SFPUC Vault No. NSFM050). This valve-vault will control flows from the existing North Shore Force Main to the new force main to be constructed in this project.

Vault No. 2 – This is a new valve-vault to be constructed as part of the project, located near the former intersection of Jackson Street and The Embarcadero, and south of the existing Jackson Street Transport Structure (SFPUC Vault No. NSFM051). This valve-vault will control flows to the existing North Shore Force Main.

Vitrified clay pipe – Pipe made from clay that has been subjected to vitrification, a process that fuses the clay particles to a very hard, inert, glass-like state.

Water main – A principal pipe in a system of pipes for conveying potable water typically installed underground.

Wetland – A zone periodically or continuously submerged or having high soil moisture, which has aquatic and/or riparian vegetation components, and is maintained by water supplies significantly in excess of those otherwise available through local precipitation.

INITIAL STUDY

North Shore to Channel Force Main Project Planning Department Case Number 2011.1370E

A. PROJECT SETTING

Introduction

The San Francisco Public Utilities Commission (SFPUC) is proposing to implement the North Shore to Channel Force Main Project (project or proposed project) in the financial district and south of Market areas of San Francisco to provide redundancy for a failing segment of the existing North Shore Force Main and thereby prevent potential discharge of untreated wastewater into the San Francisco Bay. The proposed project consists of construction of a new 3,300-foot-long force main¹—referred to as the North Shore to Channel Force Main—installation of two underground vaults for flow control at the northern terminus of the new force main and replacement/relocation of approximately 2,070 feet of water mains that conflict with the new force main. The project would be entirely located within San Francisco street rights-of-way, except for the 205-foot segment beneath the former Jackson Street right-of-way, which is partially within an existing City sewer easement and partially within City property.

Background

The existing 7,816-foot-long, 36-inch-outside-diameter North Shore Force Main transports dry-weather flows and some wet-weather flows from the North Shore Basin to the Southeast Water Pollution Control Plant (SEWPCP) via the Channel Transport/Storage Box and Channel Pump Station located in China Basin (see Figure 1). The North Shore Force Main broke at two separate locations along The Embarcadero on March 6, 2008 and June 13, 2008 (SFDPW, 2008), and was repaired under emergency construction contracts in 2008. The breaks occurred along the segments of the pipeline that were constructed of ductile iron or steel and directly buried in the soil. These segments of the pipeline are not encased and direct contact with the soil has contributed to pipeline corrosion. Since completion of the emergency repairs, the North Shore Dry-Weather Pumps have been operated at a lowered capacity to reduce the internal pressures of the existing force main, in an effort to minimize the potential for another failure. The proposed North Shore to Channel Force Main would provide redundancy for this segment of the existing North Shore Force Main that is most susceptible to failure, and allow the sewer system to operate at the full design capacity.

¹ A force main is a pressurized main pipe in which flows are pumped rather than gravity driven.



SOURCE: San Francisco Department of Public Works

North Shore to Channel Force Main

Figure 1
Project Location and Vicinity

Project Location and Setting

The project would be located in the financial district and south of Market areas of San Francisco, near the northeast waterfront, as indicated on Figure 1. The proposed North Shore to Channel Force Main alignment begins at the former intersection of Jackson Street and The Embarcadero, traveling west under the former Jackson Street right-of-way to Drumm Street, south under Drumm Street to California Street, east under the Market Street pedestrian plaza, southeast across Market Street, southeast under Spear Street to Howard Street, and then continuing northeast under Howard Street to the intersection with Steuart Street. Two vaults would be constructed near the former intersection of Jackson Street and The Embarcadero. The project would be entirely located within San Francisco street rights-of-way, except for the 205 feet beneath the former Jackson Street right-of-way, which is partially within an existing City sewer easement and partially within City property.

Land uses adjacent to the northernmost segment of the new force main alignment include high-density residential and commercial uses, as well as public recreational uses at Sue Bierman Park. The proposed segment of the new force main beneath the former Jackson Street right-of-way is within an existing sewer box (8 feet high by 9.5 feet wide) located under the Golden Gateway Tennis and Swim Club's tennis courts and under a parking lot owned by the CCSF under the jurisdiction of the Port of San Francisco. Southeast of Sue Bierman Park land uses adjacent to the alignment primarily include downtown office and commercial uses along Drumm, Spear, and Howard Streets. In the Market Street pedestrian plaza, the alignment crosses between the Hyatt Regency Hotel and the California Cable Car turnaround and the entrance to Embarcadero Bay Area Rapid Transit (BART) and San Francisco Municipal Transportation Agency (Muni) Station, approximately 60 feet above the BART tunnel.

The Embarcadero is a north-south arterial that runs between Second and Taylor Streets; Drumm Street is a north-south arterial that connects Jackson and Market Streets; and Spear Street is a one-way southbound street. Within the project area, Howard Street is a two-way east-west arterial that connects The Embarcadero to Steuart Street.

Combined Sewer System and Existing Facilities in Project Area

In general, San Francisco's combined sanitary sewer and stormwater system collects and transports both sanitary sewage and stormwater runoff in the same facilities. San Francisco is roughly divided into two major drainage areas: the Bayside and Westside basins, which are further divided into eight subdrainage areas. The project area is located in the Bayside basin, within two of the subdrainage areas: the North

Shore Basin and the Channel Basin (see Figure 1). Combined stormwater and wastewater flows from the Bayside basin are transported for treatment to the SEWPCP, located on Phelps Street between Jerrold and Evans Avenues. The SEWPCP treats up to 150 million gallons per day (mgd) of wastewater to a secondary treatment level.² During dry weather, wastewater flows consist mainly of municipal and industrial sanitary sewage and wastewater. The annual average wastewater flow during dry weather is 63 mgd, and the average dry-weather design flow capacity of the SEWPCP is 84.5 mgd.

During wet weather, the combined sewer and stormwater system collects large volumes of stormwater runoff in addition to municipal and industrial sanitary sewage and wastewater, and the combined wastewater and stormwater flow is conveyed to treatment facilities before eventual discharge to the bay. Up to 150 mgd of wet-weather flows receive secondary treatment at the SEWPCP, which can also treat up to an additional 100 mgd to a primary treatment plus disinfection. Up to an additional 150 mgd of wet-weather flows can receive primary treatment plus disinfection at the North Point Wet Weather Facility. When the capacity of these treatment facilities is exceeded, the excess flows are discharged through 29 combined sewer overflow (CSO) structures located along the city's bayside waterfront, from the Marina Green to Candlestick Point. Discharges from the CSO structures receive "flow-through treatment," which is similar to primary treatment.

The SFPUC's combined sewer system in the project area currently operates under a National Pollutant Discharge Elimination System (NPDES) permit, adopted by the San Francisco Bay Regional Water Quality Control Board (RWQCB) (Order No. R2-2008-0007) in January 2008, that covers the SEWPCP, the North Point Wet Weather Facility, and all of the bayside wet-weather facilities, including discharges from the CSOs to the bay. The permit specifies discharge prohibitions, dry-weather effluent limitations, wet-weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements. The permit prohibits overflows from the CSO structures during dry weather, and requires wet-weather overflows to comply with the nine minimum controls specified in the federal Combined Sewer Overflow Control Policy (RWQCB, 2008a). All areas that drain to the eastern basin of the city's combined sewer system, including the project area, are subject to this permit.

² Secondary treatment involves the removal of organic matter from wastewater or sewage using biological and chemical processes. This level of treatment is more rigorous than primary treatment, which removes floating and settleable solids by implementing physical methods such as screening and sedimentation. Secondary treatment is less intensive than tertiary treatment, which employs further chemical and biological processes to remove additional compounds in an effort to achieve discharge or reuse requirements.

The existing North Shore Force Main (Figure 1) transports all dry-weather flows from the North Shore Basin (up to 22 mgd) and up to 35 mgd of wet-weather flows to the Channel Pump Station via the Channel Transport/Storage Box. Once the SEWPCP has reached its secondary treatment capacity of 150 mgd during wet weather, the North Point Wet Weather Facility is activated and the North Shore Force Main is not used.

North of the Jackson Street Transport Structure, the North Shore Force Main is approximately 5,000 feet of fiberglass pipe encased in concrete inside of the North Shore Outfalls Consolidation Box (a sewer storage facility) located beneath The Embarcadero (SFDPW, 2008). South of the Jackson Street Transport Structure, the North Shore Force Main is made of metal and is not contained within a consolidation sewer box and is mostly buried directly in soil for approximately 2,770 feet until it enters the upstream (north) end of the Channel Outfalls Consolidation Box at the intersection of Steuart and Howard Streets. In this southern segment of North Shore Force Main, approximately 70 feet are constructed of ductile iron pipe housed within a 48-inch-diameter steel case pipe, and the remaining 2,700 feet are constructed of 36-inch-outside-diameter steel pipe. These ductile iron and steel pipes were constructed in 1976 and are approaching the end of an approximately 50-year lifespan. The SFPUC inspected the North Shore Force Main after repairs were made in 2008, and determined this southern segment was the most susceptible to failure, mostly due to pipeline corrosion. In addition, since completion of the emergency repairs and in an effort to minimize the potential for another failure, the North Shore Dry-Weather Pumps have been operated at a lowered capacity to reduce the internal pressures of the existing force main. The northern segment or fiberglass segments of the North Shore Force Main are determined unlikely to fail due to the pipeline material and encasement of the pipeline in an existing sewer storage facility.

In the event of a failure of the North Shore Force Main during dry weather, the North Shore Outfalls Consolidation Box has a maximum capacity of up to 40 hours of dry-weather flow (SFDPW, 2008), when nearly empty; however, if the operation of the force main cannot be restored before the storage limits are met, the combined sewer system could overflow untreated sewage into the bay, which would violate RWQCB Order No. R2-2008-0007. Currently, the force main lacks redundancy, and in the event of a failure or a shutdown for maintenance or repair, the available timeframe for completing repairs is limited to the time period before storage limits are met. The proposed project would provide redundancy for this segment of the existing North Shore Force Main that is most susceptible for failure, provide the ability to maintain sewage flows for maintenance or repairs of the ductile iron and steel portion of the existing North Shore Force Main, and allow this sewer system to operate at the full designed capacity.

B. PROJECT DESCRIPTION

Project Purpose and Need

The proposed project would include construction of a new 3,300-foot long section of force main to provide redundancy for a failing segment of the North Shore Force Main and thereby prevent potential discharge of untreated wastewater into the San Francisco Bay and allowing the sewer system to operate at the full designed capacity. The new redundant force main would allow the existing force main to be taken off-line for repairs in the future and would allow repairs to be completed with minimal disruption to service, and minimize risk of potential sewage overflows to the bay, which would be in violation of RWQCB Order No. R2-2008-0007. In addition to construction of the new force main, the project includes replacement or relocation of 2,070 feet of water mains that are currently located within the proposed force main alignment.

Project Objectives

The primary objective of the proposed project is to provide redundancy to a failing segment of the existing 36-inch-outside-diameter North Shore Force Main and allow the sewer system to operate at the full designed capacity. Overall project objectives include:

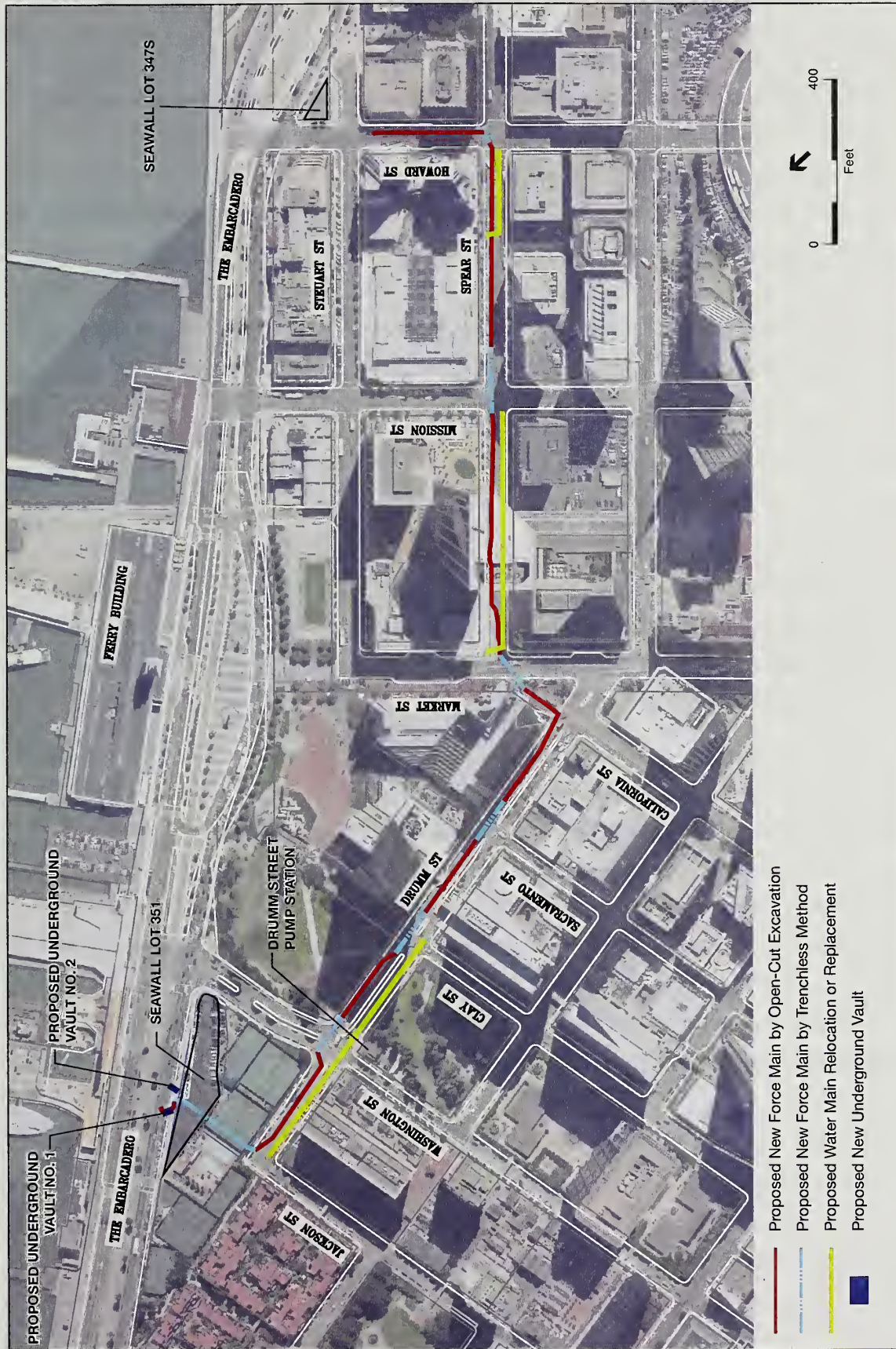
- Provide redundancy for the most susceptible segment of the North Shore Force Main to allow for repairs and maintenance with minimal disruption of service;
- Provide for 35 mgd maximum flows, consistent with the approximate capacity of the existing force main; and
- Coordinate with other City departments to minimize construction impacts.

Project Components

The major project components include the following:

- Construct two underground valve-vault structures and install associated valves and appurtenances;
- Install approximately 3,300 feet of new sewer pipeline (force main), temporarily deactivate the bypassed segment of the North Shore Force Main, and after the installation of the second valve-vault reactivate the bypassed force main into standby mode; and
- Replace water mains along two blocks of Drumm Street and relocate water mains along two blocks of Spear Street to the opposite side of street (a total of 2,070 feet of water mains).

These components are shown in **Figure 2** and discussed below.



SOURCE: San Francisco Department of Public Works

North Shore to Channel Force Main
Figure 2
 Project Features

Vault Structures

The SFPUC would construct two pile-supported reinforced-concrete, underground valve-vaults near the former intersection of Jackson Street and The Embarcadero in the locations shown on Figure 2. Vault No. 1 to the north would be partially located below the southbound lanes of The Embarcadero and partially below the sidewalk. It would house a portion of the proposed North Shore to Channel Force Main and a valve to control flow into the proposed force main. The vault would be irregularly shaped, with maximum dimensions of 40 feet long by 23 feet wide by 20 feet deep. This vault would be constructed below ground and extend from the southbound sidewalk of The Embarcadero below two southbound lanes on The Embarcadero.

Vault No. 2 would be located directly over the connection between the steel and ductile iron segments of the existing 36-inch-outside-diameter North Shore Force Main, within the southbound sidewalk on The Embarcadero. This vault would also be irregularly shaped, with maximum dimensions of 21 feet long by 16 feet wide by 23 feet deep. This vault would be constructed below ground within the southbound sidewalk on The Embarcadero. It would replace the ductile iron segment of the force main that required emergency repair in 2008, and would house a valve to control flows into the existing force main. The two valves and valve-vaults are necessary to provide controls for conveying flow to either the proposed or existing segments of the force main.

During construction of Vault No. 1 and after installation of the new North Shore to Channel Force Main, the SFPUC would temporarily deactivate the bypassed section of the existing North Shore Force Main by installing a blind flange³ on the bypassed force main. After the sewer flow has been diverted to the new force main, the 70-foot section of the existing ductile-iron pipe would be replaced with fiberglass pipe during the construction of Vault No. 2. Upon completion of Vault No. 2, the bypassed section of the existing North Shore Force Main would be placed into standby mode as a redundant force main section, as needed to carry out maintenance or repair on the new force main once Vault No. 2 is constructed. To minimize risk of interruptions to sewer services, during the 34th America's Cup (AC34) events in 2012 and 2013, the SFPUC would coordinate with the construction contractor to maintain continuous operation of the force main and associated sewer facilitates during the AC34 events (SFPUC, 2012a).

³ A flange used to close the end of a pipe.

Each valve vault would be constructed entirely below ground with a sloped floor and a sump to allow SFPUC to drop-in a portable pump to periodically dewater the vault. Removable access covers would be sized to facilitate equipment removal and maintenance tasks.

North Shore to Channel Force Main

At the northern end of the alignment, the proposed North Shore to Channel Force Main would connect to the existing North Shore Force Main beneath the intersection of The Embarcadero and the former Jackson Street. At the southern end of the alignment, the new force main would connect to an existing 7-foot-diameter sewer pipe beneath Howard Street. The new force main would be constructed of 38.5-inch-internal-diameter (42-inch-external-diameter) high-density polyethylene (HDPE); it would be approximately 3,300 feet long and installed to a depth of approximately 15 to 20 feet below grade.

The new force main alignment begins at the former intersection of Jackson Street and The Embarcadero, traveling west under the former Jackson Street right-of-way to Drumm Street, south under Drumm Street to California Street, east under the Market Street pedestrian plaza, southeast under Market Street, southeast under Spear Street to Howard Street, and continuing northeast under Howard Street to the intersection with Steuart Street (see Figure 2). Prior to project construction, private utility companies have committed to relocating any conflicting utilities with the proposed force main alignment.

Water Mains

Approximately 1,170 feet of 8-inch-diameter water main along Drumm Street (between Jackson and Clay Streets) would be replaced likely after the new North Shore to Channel Force Main installation and would be included in the SFPUC contract as part of the City's standard coordination efforts. In addition, prior to the installation of the new force main, approximately 900 feet of water mains would be relocated along Spear Street to the opposite side of the street to make room for a portion of the new force main (a 12-inch-diameter water main along Spear Street between Market and Mission Streets as well as an 8-inch-diameter water main along Spear Street between Mission and Howard Streets). The locations of the water mains to be replaced or relocated are shown on Figure 2.

Construction Activities and Schedule

Table 1 summarizes construction information (including the estimated duration of construction, excavation limits, equipment, crew size, and schedule) for each project component. In addition, construction activities

TABLE 1
SUMMARY OF PROPOSED CONSTRUCTION ACTIVITIES

Construction Activity Location	Proposed Construction Activities	Estimated Construction Duration	Approximate Depth of Excavation / Dimensions of Excavated Area	Estimated Construction Equipment	Construction Crew	Construction Timing (hours/days) ^{a,b}
<i>Vault Construction</i>						
The Embarcadero (Vault No. 1 and temporary decking)	Cut and remove pavement and concrete, off-haul pavement and concrete, install sheet piles or temporary retaining walls in excavation, excavate soil, install vault, backfill excavation, repave street, and replace sidewalks after vault installation is complete.	3 months	Vault dimensions: 40 feet long, 23 feet wide, and 20 feet deep	<ul style="list-style-type: none"> Saw-cutting machine Crane Sheetpiling hammer Excavator Loader Backhoe Paver Paving equipment Soil/concrete compactor Roller Dewatering pump 	15 workers/day	Weekdays 7 a.m. to 6 p.m.
The Embarcadero and Seawall Lot 351 (Vault No. 2)	During construction of Vault No. 1, install temporary decking over the excavation so that traffic could be maintained in the southbound lane of The Embarcadero. Following construction, dismantle the decking, repave the street, and replace street tree.	2 months	Vault dimensions: 21 feet long, 16 feet wide, and 23 feet deep			24-hour work could be needed for: - Installation of decking - up to 5 weeks (consecutive) - Vault No. 1 - up to 6 days (non-consecutive) Vault No.2 – up to 2 days (non-consecutive)
<i>Open-Trench Pipeline Construction</i>						
Install force main along Drumm Street between Jackson and Washington Streets; Washington and Clay Streets; Clay and Sacramento Streets; and Sacramento and California Streets	Remove tree at the corner of Drumm and Jackson Streets. Cut and remove pavement or masonry, off-haul pavement, install sheet piles or temporary retaining walls in trench, excavate soil, install new force main, backfill excavation, and restore pavement in affected areas after force main is installed. Replace tree.	7 months overall for force main installation 2 months for water main relocation 1 month for water main replacement	Force main: Pipeline depth: 15 to 20 feet Trench width: 8.5 feet Water mains: <ul style="list-style-type: none"> 8-inch pipe installed in a trench 18 inches wide by 36 inches deep 12-inch pipe installed in a trench 24 inches wide by 44 inches deep 	<ul style="list-style-type: none"> Saw-cutting machine Traffic control truck Crane Sheetpiling hammer Excavators Loader Backhoe Sweeper Paver Oil spreading truck Soil/concrete compactor Rollers Dewatering pump 	15 workers/day	Weekdays 7 a.m. to 6 p.m. Work on Drumm Street between Sacramento and California Streets to be conducted on weekends from 9 a.m. to 6 p.m. to avoid conflicts with Muni Bus Line Nos. 1 and 41.
Install force main along Spear Street between Market and Mission Streets, and between Mission and Howard Streets						
Install force main along Howard Street between Spear and Stuart Streets						

TABLE 1 (continued)
SUMMARY OF PROPOSED CONSTRUCTION ACTIVITIES

Construction Activity Location	Proposed Construction Activities	Estimated Construction Duration	Approximate Depth of Excavation / Dimensions of Excavated Area	Estimated Construction Equipment	Construction Crew	Construction Timing (hours/days) ^{a,b}
<i>Open-Trench Pipeline Construction (cont.)</i>						
Replace an 8-inch-diameter water main along Drumm Street between Jackson and Clay Streets						
Relocate a 12-inch-diameter water main to the opposite side of the street along Spear Street between Market and Mission Streets						
Relocate an 8-inch-diameter water main to the opposite side of street along Spear Street between Mission and Howard Streets						
Market Street Pedestrian Plaza	Remove tree at the intersection with Spear Street. Cut and remove masonry, off-haul masonry, install secant piles, jet grout soil, excavate soil, install new force main, backfill excavation, restore masonry. Replace tree.	4 months	Excavation depth: 22 feet Trench width: 15 feet	<ul style="list-style-type: none"> Saw-cutting machine Excavator Loader Backhoe Soil/concrete compactor Dewatering pump Jet grouting/soil mixing plant Jet grouting/soil mixing drill 	15 workers/day	Weekdays 7 a.m. to 6 p.m.
<i>Trenchless Construction</i>						
Former Jackson Street right-of-way between The Embarcadero and Drumm Street	Install new force main within the existing Jackson Street Transport Structure for 250 feet.	1 month	No excavation required; sewer box would be accessed through the open-cut excavation at either end of the box.	<ul style="list-style-type: none"> Concrete equipment Delivery trucks 	15 workers/day	Weekdays 7 a.m. to 6 p.m.

TABLE 1 (continued)
SUMMARY OF PROPOSED CONSTRUCTION ACTIVITIES

Construction Activity Location	Proposed Construction Activities	Estimated Construction Duration	Approximate Depth of Excavation / Dimensions of Excavated Area	Estimated Construction Equipment	Construction Crew	Construction Timing (hours/days) ^{a,b}
<i>Trenchless Construction (cont.)</i>						
Drumm Street at intersections with Washington Street, Clay Street, and Sacramento Street	Excavate a "ramming" pit at the corner of the intersection and a "receiving pit" at the opposite end. Use pipe-ramming equipment in the ramming pit to push a steel casing beneath the intersection to the receiving pit. Backfill pits, repave street, and replace curb ramps at the completion of pipeline installation.	Approximately 2.5 months at each intersection (8 weeks for excavation of pits and 2 weeks for pipeline construction)	Ramming pit: 30 feet long, 12 feet wide, 20 feet deep Receiving pit: 15 feet long, 10 feet wide, 20 feet deep Pipeline depth: 15 to 20 feet	<ul style="list-style-type: none"> Saw-cutting machine Traffic control truck Crane Sheetpiling hammer Pneumatic hammer Compressor Pilot/guide tube equipment Excavators Loader Backhoe Sweeper Paver AC pickup machine Oil spreading truck Soil/concrete compactor Rollers Dewatering pump 	10 workers/day	Weekdays 7 a.m. to 6 p.m.
Market Street at Spear Street intersection	Remove inactive, 33-inch-diameter, encased clay sewer by hand, install 65-foot segment of the new pipe by hand.	3 to 4 weeks	No excavation required. The existing sewer would be accessed through the open-cut excavations in the pedestrian plaza and on Spear Street at the intersection with Market Street. The remaining work would be conducted underground by hand.	<ul style="list-style-type: none"> Ventilators 	10 workers/day	Weekdays 7 a.m. to 6 p.m.
<i>Sewer Diversion</i>						
Install 8 inch ductile iron pipe at Stevenson Street at Ecker Street	Cut and remove pavement and concrete, off-haul pavement and concrete, install pipe, backfill and restore pavement.	1 week	Pipeline depth: 3 to 4 feet Trench width: 2 feet	<ul style="list-style-type: none"> Saw-cutting machine Jackhammer Pickup truck 	2 workers/day	Weekdays 7 a.m. to 6 p.m. Portable pumps could run 30-36 hours

TABLE 1 (continued)
SUMMARY OF PROPOSED CONSTRUCTION ACTIVITIES

Construction Activity Location	Proposed Construction Activities	Estimated Construction Duration	Approximate Depth of Excavation / Dimensions of Excavated Area	Estimated Construction Equipment	Construction Crew	Construction Timing (hours/days) ^{a,b}
<i>Sewer Diversion (cont.)</i>						
Install sandbags at Jackson Street at Sansome Street	Insert sandbags into manhole, construct support system, stack sandbags.	1 day	N/A	<ul style="list-style-type: none"> Lights Generator 	3 workers/day	Weekdays 7 a.m. to 6 p.m. Short-duration nighttime work for 6 nights (non-consecutive)

NOTES:

a SFPUC may allow the contractor to conduct weekend work on a case by case basis

b Dewatering pumps may operate 24 hours per day, seven days per week

SOURCE: San Francisco Department of Public Works 2011

related to each project component, including vault installation, pipeline installation, water main replacement/relocation, and tie-ins to the existing force main, are described in detail below. Required trench dewatering, planned staging areas, spoils disposal, anticipated truck trips, planned construction equipment, the construction schedule, and project-related plans are also addressed.

Construction Activities Common to Each Component

Prior to the start of construction, Underground Service Alert (USA North) would identify all underground utilities or the contractor would excavate potholes to determine utility locations. Before initiating excavations, the contractor would delineate the construction boundary, and the pavement around the trench would be broken up and hauled to a facility for recycling or disposal. Sheetpiles or other temporary shoring walls would be installed to prevent the trench from collapsing during excavation activities or the installation of the pipeline sections, as required by state and federal Occupational Safety and Health Administration (OSHA) regulations pertaining to excavations. Although the contractor would use watertight shoring or other methods to control groundwater inflow to the excavation, excavation dewatering could be required. Upon backfilling any excavated area, the contractor would restore the trench or excavated area according to San Francisco Department of Public Works (SFPDW) requirements (SFPDW's Order 178,940), which requires the pavement to be restored for the trench width plus one-foot on each side with 6-inch-thick concrete base and 1.5-inch-thick asphalt.

Vault Construction and Temporary Decking

Construction of the two valve-vaults would involve excavating soil within the limits of the vault structures to a maximum length of 21 or 40 feet; a maximum width of 16 or 23 feet; and depths of approximately 20 to 23 feet; installing torque down piles; and installing the vault, valve, and associated features. During construction, the contractor would leave the vault excavations open at the end of each day, but the work area would be fenced and secured to avoid accidental or unauthorized entry. Once vault construction is completed, the excavation would be backfilled, the pavement would be restored, and the sidewalk would be replaced.

The construction area for Vault No. 1 would extend from the southbound sidewalk of The Embarcadero into the southbound peak-period tow-away lane (peak-period lane)⁴ and one southbound traffic lane on

⁴ This lane is a third southbound lane between Broadway and Mission Street available on weekdays during the morning and evening commuter peak traffic periods of 7:00 to 9:00 a.m. and 3:00 to 6:00 p.m., respectively.

The Embarcadero. To minimize traffic disruption during construction, the contractor would place temporary decking over the excavation to allow traffic flow in both southbound traffic lanes of The Embarcadero. Up to 5 weeks of 24-hour construction could be required to place the decking. During this time, traffic on The Embarcadero would be restricted to one lane in the southbound direction; northbound travel would not be affected. Once the decking is installed, traffic would be restored to the second southbound traffic lane, but the peak-period lane would be closed for the remaining two months of construction. Traffic on The Embarcadero would also be restricted to one lane in the southbound direction for one week when the decking is removed and the pavement is restored on The Embarcadero. Work at Vault No. 1 could require up to 6 non-consecutive days of 24-hours construction (these 24-hour work days would be separated by at least 3 days). To accommodate the 2012 pre-race AC34 events, full sidewalk and roadway access on The Embarcadero would be maintained between August 11, 2012 and September 2, 2012 (SFPUC, 2012a). In addition, SFPUC would coordinate with the construction contractor to maintain continuous operation of the force main and associated sewer facilities during the AC34 events (SFPUC, 2012a).

Vault No. 2 would be constructed entirely within the southbound sidewalk of The Embarcadero, but the southbound peak-period lane would be closed during the entire 2-month construction period to accommodate construction activities. During construction of Vault No. 2, the existing ductile iron segment of the existing North Shore Force Main would be removed and replaced with approximately 70 feet of 36-inch-diameter fiberglass reinforced thermosetting plastic (FRP) pipe. The new FRP segment would then connect to a new valve inside Vault No. 2. Another short segment of new force main would be installed downstream of the new valve before it exits Vault No. 2 and connects to the existing North Shore Force Main southeast of Vault No. 2. Up to 2 non-consecutive days of 24-hour construction could be required for the connection work related to Vault No. 2.

For nighttime work at both vault construction work areas, nighttime lighting would be used and directed downward to ensure safe illuminated areas for construction workers and to minimize glare effects.

Force Main Installation

Installation of the new North Shore to Channel Force Main would be accomplished using open-cut excavation for the majority of the alignment; except for the segments inside the Jackson Street Transport Structure, the intersections along Drumm Street and Spear Street, and the Market Street intersection with Spear Street, where trenchless construction methods would be used. During pipeline installation,

construction activities would be limited at any one time to a maximum three-block-long area that spans two intersections.

Open-Cut Excavation

For construction by open-cut excavation within Drumm, Spear, and Howard Streets, the trench widths would be approximately 8.5 feet, and the trench depths would generally be between 15 and 18 feet below street grade (with a maximum depth of 20 feet).

Soil would be excavated to the required depth, and the bottom of the trench would be compacted. The contractor would place a crushed rock layer at the base of the trench after the compaction process has been completed, after which the new HDPE pipeline would be installed and the pipe segments connected. Subsequently, the contractor would remove the temporary shoring structures and backfill the trench with imported sand or native soil. The backfill would be compacted, and the disturbed surface over the trench would be repaved. During the construction period, these trenches would be covered at the end of each work day with steel plates.

Most of the trenching activities would occupy the on-street parking lane and one travel lane on each street. Local access would be maintained for residents and businesses throughout project construction by providing a minimum of one 11-foot-wide access lane in each direction (one way streets would have one lane maintained). Access to driveways and loading docks along the alignment would be maintained. In order to provide the required travel lanes, on-street parking spaces might be temporarily unavailable in the immediate construction area. After construction has been completed on each block, the contractor would restore on-street parking and traffic lanes as required by the Department of Parking and Traffic (DPT).

At the Market Street pedestrian plaza, the new force main would be constructed between the Hyatt Regency Hotel and the cable car terminus at the foot of California Street, above the BART tunnel. To protect adjacent structures, the contractor would install secant pile walls⁵ and jet-grout the soil. Excavation would take place within the 15-foot-wide area protected by the piles, to a depth of approximately 22 feet. The contractor would leave the excavation open at the end of each day, but would secure and fence the work area to avoid accidental or unauthorized entry.

⁵ Secant pile walls are formed by constructing intersecting reinforced concrete piles and would support the excavation.

Two trees would be removed to accommodate the proposed construction: one tree at the intersection of Jackson and Drumm Streets and one at the foot of Spear Street in the Market Street pedestrian plaza. After the underground work has been completed, these trees, and an additional tree that was previously removed, would be replaced along with the other surface restoration activities.

Trenchless Construction

Pipeline installation would be accomplished using trenchless construction techniques for installation of the pipeline segments within the Jackson Street Transport Structure, at all intersections along Drumm Street and Spear Street, and at the Market Street and Spear Street intersection.

Installation of the force main beneath the former Jackson Street right-of-way would occur entirely within the existing Jackson Street Transport Structure, an 8-foot deep by 9.5-foot-wide sewer structure. Following the necessary federal and State's confined-space-entry requirements, the contractor would enter the sewer structure and install the force main near the invert (the lowest portion) of the sewer transport structure and encase the new force main in concrete. The new force main would exit this sewer structure at the intersection of Jackson and Drumm Streets.

The contractor would employ a pipe ramming construction method to install the force main where the alignment crosses all intersections, except where the new force main is constructed inside the existing Jackson Street Transport Structure and inside an existing sewer facility under Market Street. Pipe-ramming construction does not require an open trench to install the new force main; rather, a pit is dug at each end of the section in which the pipe is to be inserted. For the proposed project, an approximately 30-foot-long by 12-foot-wide by 20-foot-deep "ramming pit" would be excavated at the beginning of each intersection, and an approximately 15-foot-long by 10-foot-wide by 20-foot-deep "receiving pit" would be excavated at the opposite side of each intersection.

Pipe-ramming equipment would be placed in the ramming pit and the steel casing pipe prepared for the operation. The end of the pipe would be pushed up against the pit wall and advanced with a hammer. The soil would be removed after the casing pipe reaches the receiving pit. HDPE pipe will then be installed inside the steel casing pipe. The contractor would leave the ramming and receiving pits open at the end of each day, but would secure and fence the work area to avoid accidental or unauthorized entry.

An inactive, 33-inch-diameter, encased clay sewer is located where the proposed force main would cross from the Market Street pedestrian plaza to the center Spear Street. In this segment, the contractor would

remove the existing sewer by hand from within the concrete casing. Once the existing sewer is removed, the new force main would be installed. No surface excavation would be required, but the pipeline installation would transition to open-cut excavation on Spear Street after the intersection of Market and Spear Streets.

Water Main Replacement and Relocation

The 8-inch-diameter water main replaced along Drumm Street and the 8- and 12-inch-diameter water mains relocated along Spear Street would be installed using open-cut excavation. The work along Drumm Street would include excavation of a trench 18-inches wide by 36-inches deep for pipeline installation, and would likely occur after the new North Shore to Channel Force Main is installed. Water main installation at the Washington Street and Clay Street intersection would be accomplished using open-cut excavation, and work at each intersection would occur for approximately two weeks. The water main relocation along Spear Street would need to take place before the proposed force main is installed, and would include excavation of a trench 18-inches wide by 36-inches deep for installation of the 8-inch pipeline and a trench 24-inches wide by 44-inches deep for installation of the 12-inch pipeline. Water service would be interrupted for up to 3 hours when service is transferred to the new water mains. The SFPUC would provide advanced notice of the date and time of the temporary service interruption to residents and businesses along the project alignment.

Shutdowns of the North Shore Force Main and North Shore Pump Station

During construction, up to six shutdowns of the existing North Shore Force Main and North Shore Pump Station would be required to connect the proposed FRP pipeline between Vault No. 1 and the existing force main; install and remove blind flanges; and tie in the new North Shore to Channel Force Main. In addition, up to two shutdowns would be required for work related to Vault No. 2. Sewer services would not be interrupted in the area during the shutdowns because sewage would be temporarily stored in the existing sewer facilities and/or sewage would be rerouted to other portions of the sewer system. Generally, shutdowns would only be allowed during dry-weather conditions. Major shutdowns beyond a 10-hour period would only be allowed during dry weather conditions and during anticipated low flows in the sewer system (generally night time), thus some nighttime work is anticipated. Dry-weather conditions is defined by SFPUC as having less than a 30 percent chance of precipitation per the National Oceanic and Atmospheric Administration's (NOAA's) forecasts.

To ensure adequate sewer service during the AC34 events in 2012 and 2013, the SFPUC would not conduct a sewer shutdown during the AC34 events.

For shutdowns that exceed a 10-hour period, the SFPUC may need to conduct additional operations at two locations:

Jackson and Sansome Streets. Prior to the shutdowns, the SFPUC would install a sandbag dam or temporary support structure within the existing sewer box at the Jackson Street and Sansome Street intersection to hold dry weather flows (see Figure 1). Installation of the sandbags would require 5 to 6 hours at night but no noisy construction equipment would be required. Lighting would be used and directed downward to ensure safe illuminated areas for construction workers and to minimize glare effects, and a small generator would be used to power the lighting.

Stevenson and Ecker Streets. During the shutdowns, the SFPUC would operate two to three portable 12-volt pumps at the Stevenson Street and Ecker Street intersection to divert sewage flows to local sewers, depending on the duration of shutdown (see Figure 1). Prior to the first shutdown, three short segments of 8-inch ductile iron pipe (totaling approximately 100 feet) would be installed below ground at the Stevenson Street and Ecker Street intersection to facilitate the sewer diversion. The pipe installation would occur for approximately one week as part of project construction. For each shutdown of the North Shore Force Main and North Shore Pump Station over ten hours, the installed pipe would be used to divert flows and two portable standby pumps would operate for approximately 30 to 36 hours, and the third pump could be used intermittently during the day (SFPUC, 2012b).

Trench Dewatering

During construction, the contractor would be required to maintain groundwater levels approximately 3 feet below the bottom of the excavations. The contractor would implement measures, such as the installation of water-impermeable shoring walls, localized sump pumps, and working pads made of crushed rock, to reduce groundwater infiltration into the excavated areas. However, additional dewatering would likely be required to maintain the appropriate groundwater levels. The contractor would discharge the water to the combined sewer system in accordance with the following: San Francisco's Industrial Waste Ordinance No. 116-97, SFDPW Order No. 158170 for wastewater discharges to the city sewerage system; the SFPUC Wastewater Enterprise/Collection System Division's requirements for batch wastewater discharges; and the SEWPCP's Construction Dewatering Site Discharge Limits. Consistent with these requirements, the contractor would prepare a dewatering plan to meet the above requirements. Dewatering pumps may operate for up to 24 hours per day, 7 days per week to maintain the appropriate groundwater levels.

Staging Areas

Construction staging areas would be located within the parking lane and work areas along the pipeline alignments. Each area would be designated for construction contractor setup and equipment and material storage. Additional offsite staging areas for equipment storage would be sited at the following locations (see **Figure 3**):

- Port of San Francisco Seawall Lot 347S, located at Howard and Steuart Streets
- SFPUC Bruce Flynn Pump Station Yard, located between Evans Avenue and Davidson Street (near Rankin Street)
- Sidewalk area along The Embarcadero, between Washington Street to the mid-block crosswalk towards Broadway (pending approval from SFMTA)
- SFPUC North Point Wet Weather Facility, located at 111 Bay Street (pending availability of space)
- SFPUC Drumm Street Pump Station, located at the intersection of Washington and Drumm Streets (pending availability of space)
- Port of San Francisco Seawall Lot 351 (along The Embarcadero near Jackson Street) (if available).

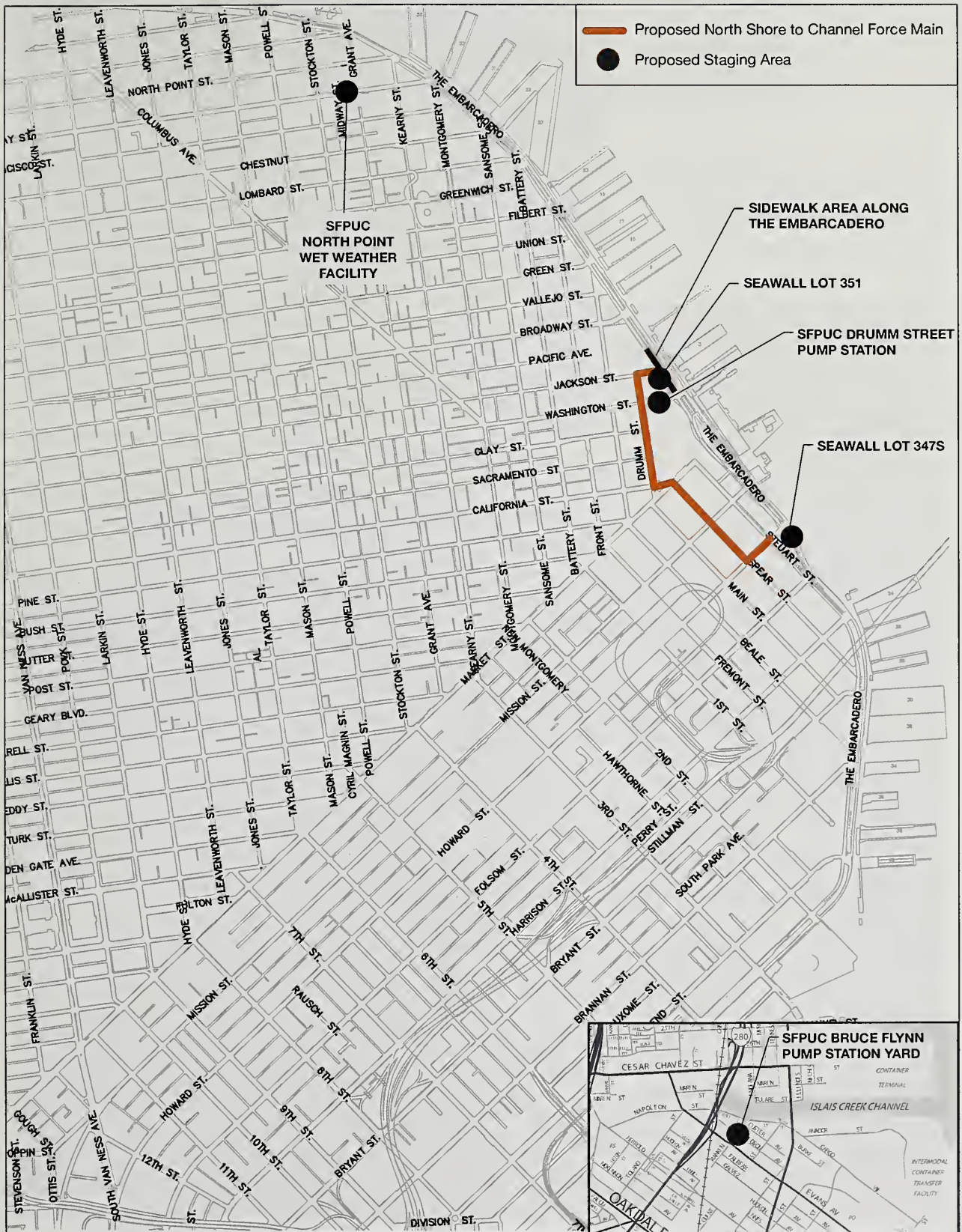
Spoils Disposal

A total of approximately 11,000 cubic yards of spoil (excess soil from excavations and asphalt pavement) is expected to be generated during project construction (see **Table 2**). No spoils are expected to be reused for the project so all 11,000 cubic yards would be hauled off site.

Truck Trips and Project Workforce

Table 2 shows the estimated number of construction-related truck trips required for materials delivery and spoils disposal. Haul routes for the trucks are shown on **Figure 4**. Trucks arriving from the east or travelling east from the project area would access the project area via the Bay Bridge, and trucks arriving from the west or heading west would access the project area via King Street and The Embarcadero. Trucks would use city streets in the vicinity of the project area.

Construction would require an estimated 15 workers per day and 10 trucks per day for open-trench construction; and 10 workers per day and 7 trucks per day for trenchless construction. Soil and disposal would involve approximately 8 truckloads per day for 135 days to haul away excess soil.



SOURCE: San Francisco Department of Public Works

North Shore to Channel Force Main
Figure 3
 Proposed Staging Area Locations

TABLE 2
ESTIMATED NUMBER OF TRUCK TRIPS

Item	Quantity	Unit	Units/ Truck Trip	Truck Trips ^a
PIPING				
36-inch-outside-diameter HDPE ^b	70	LF	345	2
42-inch-outside-diameter HDPE and FRP ^b	3,253	LF	300	22
54-inch steel casing	524	LF	100	10
18-inch-inside-diameter Vitrified Clay Pipe ^b	168	LF	700	2
San Francisco Water Department DIP pipes ^b	2,430	LF	1,215	4
<i>Subtotal Piping Truck Trips</i>				40
CRUSHED ROCK^c				
Sewer				
38.5-inch-inside-diameter HDPE	2,767	CY	10	554
<i>Subtotal Crushed Rock Truck Trips</i>				554
CLEAN BACKFILL^c				
Sewer				
38.5-inch-inside-diameter HDPE ^d	6,675	CY	10	1,336
<i>Subtotal Clean Backfill Truck Trips</i>				1,336
PAVEMENT^c				
Asphalt Concrete (AC) Type "A"	610	CY	10	122
<i>Subtotal AC Pavement Truck Trips</i>				122
CONCRETE^c				
Trench restoration	137	CY	10	28
Concrete work	1,000	CY	10	200
Concrete for vaults	68	CY	10	14
<i>Subtotal Concrete Truck Trips</i>				242
EXCAVATION AND REMOVAL^c				
Soil off-haul, manholes, shoring material, other structures	10,930	CY	10	2,186
<i>Subtotal Excavation and Removal Truck Trips</i>				2,186
Total All Loads Truck Trips				4,480

NOTES: LF = linear feet, CY = cubic yards

^a Trip = truck load x 2 (in and out).

^b Based on bundling and weight.

^c Capacity of truck = 10 CY / truck load.

^d Assumes off-hauling all excavated material for sewer trench.

SOURCE: SFDPW, 2011a.

Construction Equipment

The equipment expected to be used during project construction is shown in Table 1 and, for most activities, would include: saw-cutting machine, crane, traffic control truck, sheetpiling hammer, excavator, loader, backhoe, sweeper, paver and paving equipment, oil spreading truck, soil/concrete compactor, roller, and dewatering pump. For trenchless construction by pipe ramming, a pneumatic hammer, compressor, and pilot/guide tube equipment would also be required. For work at the Market Street pedestrian plaza, a jet grouting/soil mixing plant and jet grouting/soil mixing drill would also be used.

Construction Schedule

The SFPUC expects to complete project construction in approximately 14 months, from May 2012 through June 2013. To minimize potential conflicts with morning and evening commute traffic, construction activities on Drumm, Spear, and Howard Streets would generally occur Monday through Friday between 9:00 a.m. and 4:00 p.m., though work could occur from 7:00 a.m. to 6:00 p.m. Construction activities on The Embarcadero would generally occur Monday through Friday, from 9:00 a.m. to 3:00 p.m., though work could occasionally occur from 7:00 a.m. to 6:00 p.m. and at night or on weekends. At the city blocks located within the San Francisco holiday construction moratorium, no construction would take place between Thanksgiving and New Year's (November 22, 2012 through January 1, 2013).⁶ Construction activities would be coordinated with the AC34 events such that full sidewalk and roadway access would be provided along The Embarcadero during the 2012 AC34 events (August 11, 2012 through September 2, 2012) and no construction activities would occur on The Embarcadero during the 2013 events (July 4, 2013 through September 22, 2013). To avoid conflicts with San Francisco Municipal Transportation Agency (SFMTA or Muni) Trolley Coach Lines No. 1 (California) and No. 41 (Union), work along the segment of Drumm Street between California and Sacramento Streets would be restricted to the weekends between 9:00 a.m. and 8:00 p.m., when these bus lines do not operate on this block. SFPUC may conduct additional weekend work on a case-by-case basis at other work areas, and upon coordination with other City departments, such as SFMTA, SFDPW and the Port.

The SFPUC may elect to perform 24-hour construction (including weekends) for some of the work, including:

⁶ The SFDPW halts road construction work on busy commercial corridors between Thanksgiving Day and New Years to minimize traffic congestion and effects on businesses and shoppers during the peak shopping season. Streets with 50 percent or more commercial use, determined at the time of construction, are subject to this moratorium. Work may be allowed between the hours of 10 p.m. and 7 a.m. as long as the proper night noise permit is obtained.

- Up to five weeks for construction of temporary decking over a portion of The Embarcadero for Vault No. 1 construction;
- Up to six days (non-consecutive) for Vault No. 1 construction and tie-in to existing force main; and
- Up to two days (non-consecutive) for Vault No. 2 construction and tie-in to existing force main.

The estimated construction schedule is presented in **Figure 5**. The estimated construction duration for each project component is as discussed below, although some construction activities may overlap:

- Site mobilization and preparation – approximately 2 months, from May 2012 through June 2012
- Vault No. 1 (including decking) – approximately 3 months, between July 2012 and February 2013⁷
- New force main (north of Market Street) – approximately 7 months, between July 2012 and May 2013
- New force main (south of Market Street) – approximately 6 months, between September 2012 and May 2013
- Water main relocation (Spear Street) – approximately 2 months, between July 2012 and November 2012
- Water main relocation (Drumm Street) – approximately 1 month, between March 2013 and April 2013
- Vault No. 2 – approximately 2 months, between May 2013 and June 2013⁸

Project-Related Plans

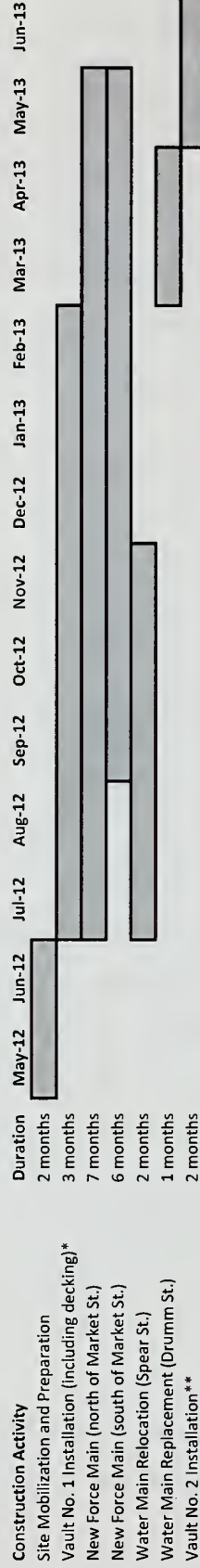
The construction contractor would be required to comply with SFPUC contract specifications, which include preparation and implementation of project-related plans for dust control, noise control, dewatering, erosion/sediment control, debris management, shoring, instrumentation/monitoring, and traffic control. These plans are described below.

Dust Control Plan

As required in SFPUC's contract specifications and consistent with San Francisco Health Code Section 1247, the construction contractor would establish a dust control plan to minimize dust generated at construction work areas to the extent feasible. This plan would include a suite of dust control measures

⁷ Full roadway access would be maintained on The Embarcadero between August 11, 2012 and September 2, 2012 to accommodate AC34 pre-race events.

⁸ In the event that Vault No. 2 construction cannot be completed prior to AC34 2013 race events (by end of June 2013), Vault No.2 construction would occur after October 1, 2013.



* Any Vault No. 1 work between August 11, 2012 and September 2, 2012 (during the AC34 pre-race events) would maintain full roadway access on The Embarcadero.

** Vault No. 2 construction work would occur for 2 months either prior to June 30, 2013 or after October 1, 2013.

including but not limited to the following measures: washing the tires of excavation and spoils trucks before entering city streets, utilization of a wet vacuum sweeper at the construction work areas to minimize dust emissions, covering dust-generating stockpiled material, mechanically sweeping sidewalks and street areas affected by construction activities at the end of each work day, among other measures. Refer to Section E.7, Air Quality, for additional information regarding the project's dust control plan.

Noise Control Plan

As required in the SFPUC's contract specifications and consistent with Article 29 of the Police Code, Regulation of Noise, the construction contractor would be required to prepare and submit a noise control plan to the appropriate City agencies for review and approval. This plan would include but not be limited to the following elements:

- Method(s) used by the contractor to minimize the likelihood that construction equipment noise exceed the San Francisco Noise Ordinance (Article 29 of the *San Francisco Police Code*, revised November 25, 2008) requirements;
- List of equipment with attenuation devices;
- List of control measures that would be implemented in the event construction-related noise exceeds the San Francisco Noise Ordinance criteria; and
- Control measures that would be implemented in the event noise levels exceed the San Francisco Noise Ordinance criteria or noise complaints are received from the public.

Dewatering Plan

As required in the SFPUC's contract specifications and consistent with Article 4.1 of the San Francisco Public Works Code (supplemented by Department of Public Works Order No. 158170), the construction contractor would be required to submit a dewatering plan to the City at least thirty days prior to the start of any excavation work to address groundwater dewatering. The dewatering plan would include but not be limited to:

- Drawings and descriptions of the proposed groundwater control system;
- Methods proposed to handle, treat, dewater and dispose of groundwater flows;
- Proposed points of discharge to the sewer;
- Disposal plan for settled waste, and floatable and oily wastes; and

The sewer discharge application and permit.

Erosion and Sediment Control Plan

The SFPUC's construction contractor would be required to develop and implement an erosion and sediment control plan to address construction-related runoff. This plan would include a suite of best management practices, including but not limited to the following: installation of temporary sediment barriers such as fiber rolls, sandbags, gravel bags in areas with potential erosion; installation and maintenance of silt dams on public streets to prevent sediments from flowing into storm drain inlets and public streets; and use of erosion control blankets to control and stabilize disturbed and exposed soil as needed.

Construction and Demolition Debris Management Plan

As required in SFPUC's contract specifications and prior to the start of construction, the construction contractor would be required to prepare a construction and demolition debris management plan to estimate the types and quantities of materials that would be generated by project excavation and construction. The plan would include the following information:

- Procedures used for debris management;
- List of materials and estimated quantities to be reused, recycled or transported to an off-site facility, consistent with San Francisco's Construction and Demolition Debris Recovery Program (Ordinance No. 27-06, adopted July 1, 2006);
- Procedures that would be used for source separation for recyclable and reusable materials; and
- Procedures to educate and train all on-site workers on recycling and reuse procedures to be used at the construction work sites.

Shoring Plan

As required in SFPUC's contract specifications and consistent with Section 6705 of the California Labor Code, the construction contractor would be required to prepare a shoring plan prior to the start of any trench excavation that would exceed 5 feet in depth. The shoring plan would include the details and supporting calculations of the design of shoring, bracing, sloping, or other provisions to be made for worker protection during shoring excavation work. The plan should be consistent with the shoring system standards established by the Construction Safety Orders of California's Division of Occupational Safety and Health (Cal/OSHA).

Instrumentation and Monitoring Program

To minimize the potential effects of the proposed project on adjacent infrastructure and buildings along the project alignment, the SFPUC has prepared an Instrumentation and Monitoring Program as part of the contract specifications. The program would be implemented by city staff, engineering consultants and the construction contractor to monitor for ground settlements, building settlements, vibration, and lateral deformations caused by construction activities such as jet grouting and excavation. In accordance with the specifications, the construction contractor would be required to engage the services of an instrumentation specialist to install sub-pavement markers and inclinometers to monitor for settlement, and perform vibration monitoring at selected locations along the project alignment.

During excavation activities, the construction contractor would be required to limit the settlement on both sides of the excavation to 2.5 inches within three feet of the shoring walls, and to 0.50 inch at the closest property line. During pipe ramming activities, the contractor would be required to implement corrective action when settlements reach 0.5-inch and to stop work when settlement reaches 1-inch. The specifications also restrict any vibratory activities by the construction contractor to peak particle velocities of 0.50 inches/second (in/sec) or less at the closest adjacent structures for vibration activities less than 4 hours, and to peak particle velocities less than 0.20 in/sec for vibration activities over longer periods (a few days). The SFPUC would stop the construction contractor's activities when allowable vibration thresholds or settlement thresholds are exceeded and require the construction contractor to modify his/her activities to stay within the thresholds.

Vibration monitoring would be performed on an as-needed basis but would generally occur if vibratory hammers or sonic equipment are used, during sheetpile driving activities, and during pipe ramming activities. Vibrations would be monitored at adjacent building locations and at public improvements when induced vibrations could affect adjacent buildings or improvements. Vibration would also be monitored at critical locations as directed by the City. An instrumentation specialist would perform a preconstruction survey of the exterior of all buildings along the project alignment, and a city representative would participate in the survey. The survey would include photographing the exterior of each building and recording any evidence of distress, such as cracks, distortions in the building frame, and any evidence of total and differential settlement.

The Instrumentation and Monitoring program also requires baseline surveys and settlement monitoring during construction to quantify settlement during project implementation. A post-construction survey would also be conducted.

Traffic Control Plan

SFPUC has developed traffic requirements with a Traffic Engineer, who is assigned to the project by SFMTA. The traffic requirements were developed by SFPUC and the SFMTA's Traffic Engineer, who coordinates the requirements with the City's Transportation Advisory Staff Committee (TASC). As required in SFPUC's contract specifications, the construction contractor would be required to develop a detailed Traffic Control Plan, which will be reviewed and approved by the SFMTA Traffic Engineer. The specific elements of the Traffic Control Plan are addressed in Section E.5, Transportation and Circulation.

Operations and Maintenance

Once the project is constructed, the SFPUC would be responsible for normal maintenance of the new North Shore to Channel Force Main, appurtenant structures, and mechanical systems to ensure proper operation, cleaning, and odor control. Similar to current maintenance practices for existing SFPUC pipelines, operators would need access to the valve vaults for routine maintenance once per year, which could require closure of one or more traffic lanes for up to one day to access the vaults; this work could be conducted during off peak day time hours (9:00 a.m. to 3:00 p.m.) or in the evening to minimize interference with traffic on The Embarcadero. The crew size would be three to four people.

Project Permits and Approvals

Following completion of the environmental review process, the SFPUC would approve the proposed project. In addition to this approval, it is anticipated that the SFPUC will enter into a memorandum of understanding with the Port of San Francisco for use of a portion of Seawall Lot 347S as staging area and a portion of Seawall Lot 351 (if available).

Other Projects in the Vicinity

Reasonably foreseeable future projects occurring in the vicinity of the proposed project that could potentially result in cumulative impacts with the North Shore to Channel Force Main Project are described and summarized in Table 3 and their locations are shown on Figure 6. Four projects included in Table 3 — the 34th America's Cup Project, James R. Herman Cruise Terminal and Northeast Wharf Plaza Project, the 8 Washington Street/Seawall Lot 351 Project, and SFDPW Pavement Renovation Project (Project 1856J) — are described in more detail below, due to their construction schedule and proximity to the proposed project. The potential for cumulative impacts is addressed in the individual technical sections provided in Section E.

TABLE 3
PROJECTS THAT COULD CONTRIBUTE TO CUMULATIVE IMPACTS

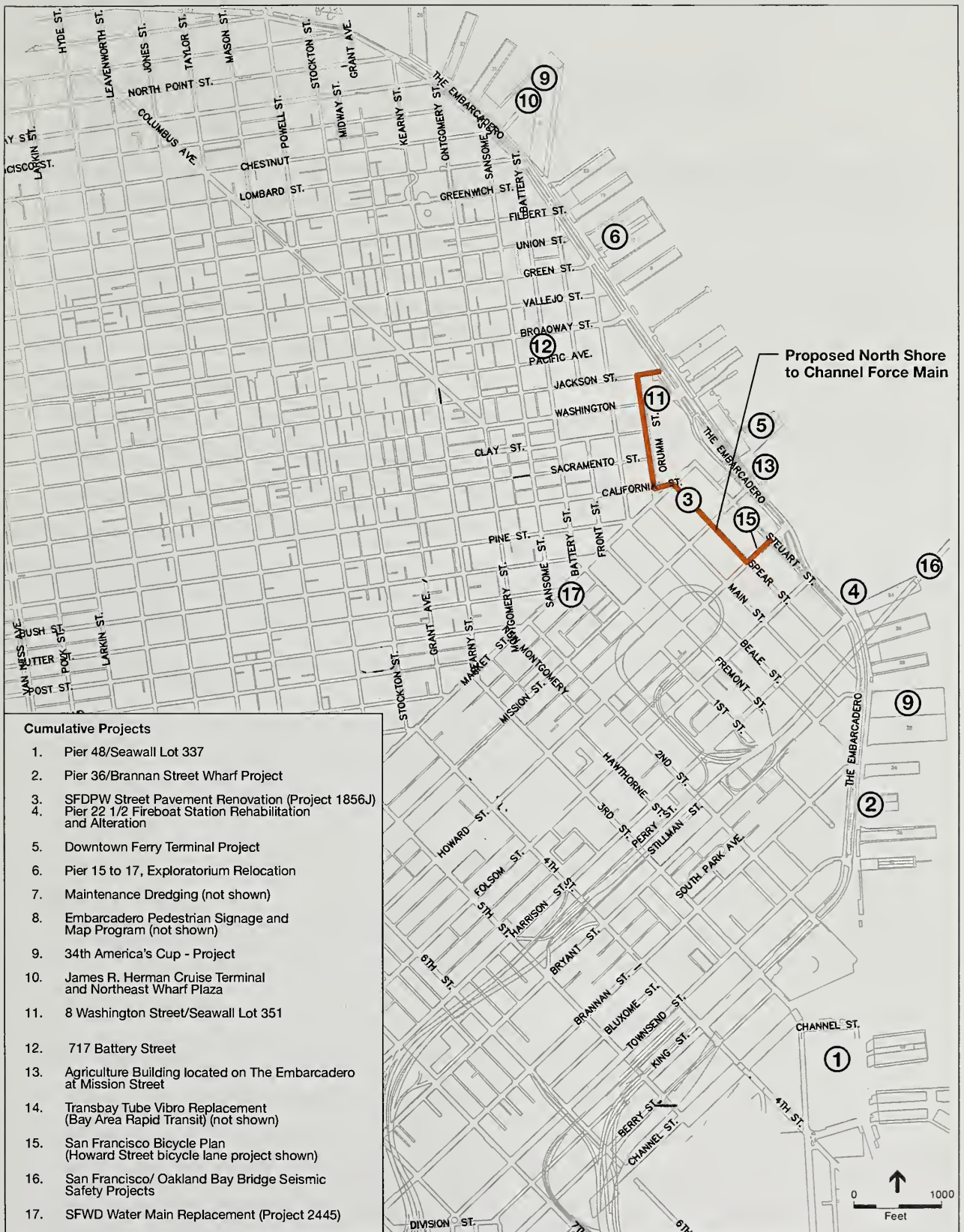
Project No.	Project Name (Jurisdiction, if applicable)	Project Summary	Estimated Construction Schedule/ Project Status
1	Pier 48/Seawall Lot 337 (Port of San Francisco)	Development of the 16-acre Seawall Lot 337, which includes improvements to Terry Francois Boulevard, partial conversion to open space, and possible rehabilitation of Pier 48.	Scheduled for 2014-2015.
2	Pier 36/Brannan Street Wharf Project (Port of San Francisco)	Construction of a 57,000 square-foot public park over the water and parallel to The Embarcadero Promenade consisting of a lawn, walkway with seating, and floating dock for kayaks.	Scheduled for January 2012 through June 2013.
3	SFDPW Street Pavement Renovation (Project 1856J).	Repave most of the streets in the same alignment of the North Shore to Channel Force Main project as part of the SFDPW's 5-Year capital improvement program	March to November 1 of 2013.
4	Pier 22 ½ Fireboat Station Rehabilitation and Alteration (Port of San Francisco)	Rehabilitation and alteration of Fire Station 35 at pier 22½.	Planning underway; construction schedule to be determined.
5	Downtown Ferry Terminal Project (Port of San Francisco)	Plans for the Phase II development of the Downtown Ferry Terminal are currently being studied by the Water Emergency Transportation Authority.	Environmental review underway. Construction anticipated to begin Spring 2014 or later.
6	Pier 15 to 17, Exploratorium Relocation (Port of San Francisco)	Relocation of the Exploratorium from the Palace of Fine Arts to Piers 15 and 17 on The Embarcadero at Green Street.	Construction currently underway and expected to be completed by November 2012.
7	Maintenance Dredging (Port of San Francisco)	Maintenance dredging of sediments from Fisherman's Wharf, Hyde Street Harbor, Pier 9, Berth 27, Berths 35 East and West, Pier 40, Berths 80A through D, Islais Creek and Approach, Berths 92 East and West, Berth 94, Berth 96, Downtown Ferry Terminal and other similar sites at the Port of San Francisco waterfront.	Scheduled for 2011 to 2015. In 2012, the Port would dredge both sides of Pier 35 in early summer and parts of Berths 80B and 80C in the late summer.
8	Embarcadero Pedestrian Signage and Map Program (Port of San Francisco)	Installation of pedestrian signage and maps along The Embarcadero.	Currently underway.
9	34th America's Cup Project	The CCSF and the America's Cup Event Authority propose to host the 34th America's Cup (AC34) sailing races in San Francisco Bay. Venues proposed for AC34 events include piers (Piers 19, 19 ½, 23, 27-29 ½, 26, 28, 30-32, and 80), water basins/water areas (Piers 19-23, 23-27, 29-31, 14-22 ½, 26-28, 28-30, and 32-36), and Seawall Lot 330. Venues near the North Shore to Channel Force Main project for spectator-related activities include Justin Herman Plaza.	Construction underway and continues through Fall 2013: <ul style="list-style-type: none"> - Installation of substructure, team bases, floating docks, wave attenuators, and moorings at Piers 30-32: January to March 2012 - Dredging at Piers 14-22 ½ Open Water Basin: June 2012 - Team base construction at Piers 30-32 April to July 2012 - AC Village landside installations at Piers 27-29: Spring 2013 - Removal of floating docks at Piers 14-22½ Open Water Basin: Fall 2013

TABLE 3 (Continued)
PROJECTS THAT COULD CONTRIBUTE TO CUMULATIVE IMPACTS

Project No.	Project Name (Jurisdiction, if applicable)	Project Summary	Estimated Construction Schedule/ Project Status
10	<i>James R. Herman Cruise Terminal and Northeast Wharf Plaza Project</i>	<i>The Port would develop Pier 27 as the James R. Herman Cruise Terminal and Northeast Wharf Plaza. The project would be coordinated with the America's Cup Project and would include demolition of the existing Pier 27 shed, a portion of the Pier 29 shed, and Pier 27 Annex Building prior to the AC34 events. The Port would construct the core and shell of the cruise terminal for the AC34 Village in 2013. Following completion of the AC34 event, the Port would complete construction of the new cruise terminal and wharf plaza.</i>	- Demolition work at Piers 27-29 and construction of cruise terminal shell and core: January 2012 through July 2013 - Construction of cruise terminal and wharf plaza: late 2013 to spring 2014
11	8 Washington Street /Seawall Lot 351	Demolition of the existing Golden Gateway Tennis and Swim Club and construction of two new mixed-use buildings (residential and retail) and outdoor health club facilities with tennis courts and pool. Development of the existing 27,937 square-foot parking lot for restaurant/retail and parking uses.	Pending final approvals. Construction scheduled for July 2012 through late 2014.
12	717 Battery Street	Construction of a two-story penthouse addition to an existing three story office building.	Environmental review complete. Construction underway, expected to be completed 2013 or later.
13	Agriculture Building located on The Embarcadero at Mission Street	Rehabilitation and seismic upgrades to the existing Agriculture Building, which may include the following uses: support for expanded ferry services, restaurant, retail, and office.	Currently in the planning phase; construction anticipated to begin 2014 or later.
14	Transbay Tube Vibro Replacement (Bay Area Rapid Transit)	Thickening of the soil surrounding the Transbay Tube as part BART's systemwide Earthquake Safety Program.	Construction associated with vibro-replacement complete. Construction associated with bolting 2.5-inch steel plates on the concrete wall of the Transbay Tube is expected to begin in Spring 2012 and be completed by 2014.
15	San Francisco Bicycle Plan	Includes near-term bicycle route improvement projects, long-term bicycle route network improvement projects, and minor improvements such as signage and pavement marking changes on Battery, Drumm, Washington, Steuart, and Howard Streets. No excavation or substantial construction activities would be required.	Several weeks to several months of activity estimated to occur between April 1, 2012 and January 1, 2015.
16	San Francisco/ Oakland Bay Bridge Seismic Safety Projects	Seismic improvements to the San Francisco Bay Bridge, including construction of a new approach and seismic improvements to the west span of the bridge, reconstruction of the two-mile long east span, a new transition structure on Yerba Buena Island, among other improvements.	Construction of the self-anchored suspension span currently underway; anticipated to be completed by late 2013.
17	SFWD Water Main Replacement (Project 2445)	Water main replacement work at and in the vicinity of the Stevenson Street and Ecker Street intersection.	January through September 2012.

NOTE: Shaded rows indicate cumulative projects that would occur within 1,000 feet of the North Shore to Channel Force Main Project area. *Italic* rows indicate cumulative projects that have overlapping construction schedules with the North Shore to Channel Force Main Project.

SOURCES: City and County of San Francisco, 2011; Port of San Francisco, 2012a and 2012b; BART, 2011 and 2012.



SOURCE: San Francisco Department of Public Works; ESA

North Shore to Channel Force Main . 209034.10

Figure 6
Cumulative Projects

TABLE 4
AC34 AND CRUISE TERMINAL CONSTRUCTION SCHEDULE

Location	Activity	Proposed Start Date ^a	Duration (weeks)
AC34 2012			
Piers 30-32 ^b	Installation of substructure, team bases, floating docks, wave attenuators, and moorings	Spring 2012	28
AC34 2012/2013			
Pier facilities	Repair of pier apron/fender	Spring 2012	28
Piers 28-30 Water Area, Piers 32-36 Open Water Basin, and Piers 14-22½ Open Water Basin	Dredging	June 2012	8
Cruise Terminal Phase 1			
Piers 27-29	Removal of Pier 27 shed, portion of the Pier 29 shed, and Pier 27 Annex office building; construction of new east and corner wall for Pier 29 shed, cruise terminal core building and shell	January 2012 through December 2012	52
AC34 2013			
Pier 28, Pier 26, Piers 14-22½ Open Water Basin, Pier 19, Pier 23, Piers 27-29	Installation of floating docks and moorings	October 2012	24
Pier sheds	Improvements to interiors, installation of temporary support features	Summer 2012/ Spring 2013	8-12
Piers 27-29	Installation of AC Village landside facilities	Spring 2013	2-4
Piers 27-29	Removal of AC Village landside facilities	Fall 2013	2
Piers 30-32 and Piers 32-36 Open Water Basin	Removal of team bases, floating docks, and moorings	Fall 2013	6-8
Pier 28, Pier 26, Piers 14-22½ Open Water Basin, Pier 19, Pier 23, Piers 27-29	Removal of floating docks, wave attenuators, and moorings	Fall 2013	12-16
Pier sheds	Removal of temporary support installations	Fall 2013	6-8

^a AC34 construction schedule subject to change and would be conducted in conformance with all applicable permitting requirements.

SOURCE: City and County of San Francisco, 2011.

34th America's Cup and James R. Herman Cruise Terminal and Northeast Wharf Plaza Projects

Two projects, the 34th America's Cup and the James R. Herman Cruise Terminal and Northeast Wharf Plaza Projects, would include construction activities in the vicinity of the North Shore to Channel Force Main Project and within the same time frame. The City and County of San Francisco (CCSF) and the America's Cup Event Authority – the 34th America's Cup project sponsors – propose to host the AC34 sailing races in San Francisco Bay during summer-fall 2012 and summer-fall 2013. This project includes several components: sailing races on San Francisco Bay, spectator venues at various parkland and other waterfront locations, and improvements along the San Francisco waterfront that entail limited construction of temporary berthing and other race-related facilities. **Table 4** summarizes AC34 construction activities proposed in the vicinity of the North Shore to Channel Force Main Project (generally between Piers 27-29 to the north and Piers 30-32 to the south) and the timing of these activities. During the AC34 races, a live site would also be set up at Justin Herman Plaza where the races could be viewed remotely on large outdoor television screens.

The America's Cup World Series Events and Youth America's Cup Series are scheduled to take place from August 11 through September 2, 2012. The AC34 2013 (Louis Vuitton Cup, America's Cup Challenger Series) would take place from July through September, 2013.

The James R. Herman Cruise Terminal and Northeast Wharf Plaza project would be coordinated with the AC34 project. Phase 1 of the project would include demolition of the existing Pier 27 shed, a portion of the Pier 29 shed, and Pier 27 Annex Building and construction of the cruise terminal core building and shell prior to the AC34 events. The AC34 project would then use Piers 27-29 and the cruise terminal core building and shell for the America's Cup Village in the summer-fall of 2013. After the AC34 events in 2013 are completed, the Port of San Francisco would then complete Phase 2 of the terminal project, consisting of completion of the cruise terminal facilities and construction of the wharf plaza on Pier 27.

8 Washington Street/Seawall Lot 351 Project

The 8 Washington Street/Seawall Lot 351 Project would demolish the Golden Gate Tennis and Swim Club facility and the existing surface parking lot on Seawall Lot 351 and would construct two residential buildings south of the former Jackson Street right-of-way: one along The Embarcadero (four to six stories) and another along Drumm Street (8 to 12 stories). Together, the buildings would contain approximately 165 residential units, 420 underground parking spaces for residents and the public, and ground-floor retail and restaurant space. This project would also construct a new publicly accessible

open space area above the former Jackson Street right-of-way, a one-story fitness center building, two swimming pools, four tennis courts, a restaurant, and an open space area to the east of Pacific Avenue. If the project is approved, construction is expected to start in July 2012 and continue for up to 29 months. The buildings would be ready for occupancy in 2014.

SFDPW Street Pavement Renovation Project

The SFDPW's 5-year capital improvement program includes projects for street resurfacing repair and reconstruction, sidewalk repairs, construction of curb ramps, and street structure repair. One of these projects, Project 1856J, includes the paving of Drumm, Spear, and Howard Streets along the project alignment. SFDPW plans to repave most of the streets common to the proposed project alignment from curb to curb. Repaving would include repairing the 8-inch-thick concrete base where necessary and applying new 2-inch-thick asphalt. Repaving and configuration of the traffic lanes would meet current SFDPW and SFMTA standards. New accessible curb ramps would be installed at various locations. SFDPW has coordinated the construction scheduling for Project 1856J with the proposed project and it is expected that the paving project will occur for two to five months between March to November 2013 following completion of the North Shore to Channel Force Main project.

C. COMPATIBILITY WITH ZONING, PLANS, AND POLICIES

	<i>Applicable</i>	<i>Not Applicable</i>
Discuss any variances, special authorizations, or changes proposed to the <i>Planning Code</i> or Zoning Map, if applicable.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Discuss any conflicts with any adopted plans and goals of the City or Region, if applicable.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Discuss any approvals and/or permits from City departments other than the Planning Department or the Department of Building Inspection, or from Regional, State, or Federal Agencies.	<input checked="" type="checkbox"/>	<input type="checkbox"/>

This section identifies and discusses regional and local land use plans and policies relevant to the proposed North Shore to Channel Force Main Project and evaluates the project's consistency with these plans and policies, which apply to projects within San Francisco's jurisdictional boundaries. This information is relevant to evaluating project impacts with respect to specific California Environmental Quality Act (CEQA) significance criteria that require analysis of a proposed project's compatibility with certain aspects of local and land use plans and policies.

The project would be located within the CCSF, primarily within existing streets and/or utility corridors. No variances, special authorizations, or changes to the *San Francisco Planning Code* are proposed as part of this project; therefore, these issues are not discussed further. Permitting requirements are discussed above in Section B, Project Description (Project Permits and Approvals).

PLANS AND POLICIES

The San Francisco City Charter and other CCSF plans and policies guide the management of the SFPUC. These plans include the *San Francisco General Plan* (CCSF, 1996), which sets forth the comprehensive, long-term land use policy for the CCSF; the Port's *Waterfront Land Use Plan* (Port of San Francisco, 2004), which defines acceptable uses, policies, and land use information applicable to all properties under the San Francisco Port Commission's jurisdiction; and the *Sustainability Plan for San Francisco* (CCSF, 1997a), which addresses the sustainability policies of the CCSF.

San Francisco General Plan

The *San Francisco General Plan* provides general policies and objectives to guide land use decisions. Any conflict between the proposed project and policies that relate to physical environmental issues is discussed in Section E, Evaluation of Environmental Effects. The compatibility of the proposed project with *General Plan* policies that do not relate to physical environmental issues would be considered by decision-makers as part of their decision to approve or disapprove the proposed project. Any potential conflicts identified as part of this process would not alter the physical environmental effects of the proposed project.

Waterfront Land Use Plan

The *Waterfront Land Use Plan* (WLUP) was adopted by the San Francisco Port Commission in 2004 and defines acceptable uses, policies, and land use information applicable to all properties under the Port Commission's jurisdiction. The WLUP enables the Port Commission, the CCSF, and the community to jointly define locations for new public-private partnership projects, coordinated with major public open space, maritime, and historic preservation improvements along the waterfront. The WLUP is intended to (1) actively promote the continuation and expansion of industrial, commercial, and recreational maritime activities; (2) support new and existing open space and public access; (3) recognize the structure of the Port for revenue-generating land uses to fund open space and maritime and public activities along the waterfront; (4) adapt to fluctuating economic, social, and political structures by identifying the range of

acceptable uses for Port properties; (5) encourage efficient use of currently underutilized Port properties by allowing a range of interim uses; and (6) establish a framework for streamlining the entitlement process for new development. The North Shore to Channel Force Main Project would be located within the WLUP's Ferry Building Subarea, which extends from the Pier 5 bulkhead building to Rincon Park (between Jackson and Harrison Streets). The WLUP objectives for the Ferry Building Subarea include the following:

- Restore the Ferry Building as the centerpiece of the waterfront
- Reintegrate with Downtown and the Market Street corridor
- Expand and connect transportation on water and land
- Re-establish the area's civic importance

Construction of the two proposed underground vaults, staging at Seawall Lot 347S, and potential staging at Seawall Lot 351 (pending availability of space) would take place within the Port's Ferry Building Seawall Subarea. Because of the temporary nature of the North Shore to Channel Force Main Project and because the below ground vaults would not be visible once construction is complete, the project would not conflict with the Port's objectives for the Ferry Building Subarea.

Sustainability Plan for San Francisco

In 1993, the San Francisco Board of Supervisors established the Commission on San Francisco's Environment, charged with, among other things, drafting and implementing a plan for San Francisco's long-term environmental sustainability. The goal of the *Sustainability Plan for San Francisco* is to enable CCSF and its people to meet their current needs without sacrificing the ability of future generations to meet their own needs. The *Sustainability Plan for San Francisco* is divided into 15 topic areas, 10 that address specific environmental issues (air quality; biodiversity; energy, climate change and ozone depletion; food and agriculture; hazardous materials; human health; parks, open spaces, and streetscapes; solid waste; transportation; and water and wastewater), and five that are broader in scope and cover many issues (economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management). Although the *Sustainability Plan for San Francisco* became official CCSF policy in July 1997, the Board of Supervisors has not committed CCSF to perform all of the actions addressed in the plan. The *Sustainability Plan for San Francisco* is a blueprint, with many of its individual proposals requiring further development and public comment. The proposed project would be consistent with the goals of the sustainability plan because the project would maintain San Francisco Bay by preventing pollution associated with potential leaks from the North Shore Force Main and would maintain the physical resources and systems that support life in San Francisco.

Proposition M – The Accountable Planning Initiative (Priority Policies)

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added Section 101.1 to the *San Francisco Planning Code* to establish “priority policies.” These policies, and the sections of this initial study addressing environmental issues associated with the policies, are: (1) preservation and enhancement of neighborhood-serving retail uses; (2) protection of neighborhood character (Question 1c, Land Use and Land Use Planning); (3) preservation and enhancement of affected housing (Question 3b, Population and Housing), with regard to housing supply and displacement issues; (4) discouragement of commuter automobiles (Questions 5a, b, and f, Transportation and Circulation); (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership (Question 1c, Land Use and Land Use Planning); (6) maximization of earthquake preparedness (Questions 14a, Geology and Soils); (7) landmark and historical preservation (Question 4a, Cultural and Paleontological Resources); and (8) protection of open space (Questions 9a and b, Wind and Shadow, and Questions 10a and c, Recreation).

CCSF is required to find that a proposed project or legislation is consistent with the priority policies before any of the following actions are taken: issuing a permit for any project that requires an initial study under CEQA; issuing a permit for any demolition, conversion, or change of use; or taking any action that requires a finding of consistency with the *San Francisco General Plan*. Section E, Evaluation of Environmental Effects, of this initial study discusses the consistency of the proposed project with the environmental topics associated with the priority policies. Because the project facilities would be below ground and minimal changes to the wastewater system operations would be required, there generally would be no conflicts with the priority policies.

Environmental Plans and Policies

Environmental plans and policies directly address environmental issues and/or contain targets or standards that must be met to preserve or improve characteristics of the City’s physical environment. The proposed project would not substantially conflict with any adopted environmental plan or policy. The Bay Area Air Quality Management District (BAAQMD) *Bay Area 2005 Ozone Strategy* (BAOS) (BAAQMD, 2006) is the most recently adopted regional air quality plan applicable to the project area. BAOS air quality standards are based on the population projections of the Association of Bay Area Governments (ABAG). The project would not result in population growth and thus would comply with the BAOS. Question 7a (Air Quality) presents more detailed analysis of consistency with the BAOS. The project would also comply with all requirements set forth by CCSF’s Urban Forestry Ordinance, which protects street trees within the public

right-of-way. Section E.13, Biological Resources, presents more detailed analysis of consistency with this ordinance. In addition, as described in Section E.15, Hydrology and Water Quality, the project would comply with Article 4.1 of the San Francisco Public Works Code (supplemented by SFDPW Order No. 158170), which incorporates the SFPUC's NPDES permit requirements regarding stormwater discharges (RWQCB Order No. R2-2008-0007), adopted in 2008. As described in Section E.16, Hazards and Hazardous Materials and E.7, Air Quality, the project would also comply with Article 22A of the San Francisco Health Code (Analyzing the Soil for Hazardous Waste, formerly the Maher Ordinance) relating to the potential to encounter contaminated soil; Article 22B of the San Francisco Health Code (Construction Dust Control Ordinance #176-08), which is designed to minimize off-site visible dust from construction projects; and Article 21 (Hazardous Materials) regarding the removal of underground storage tanks (USTs).

Regional Plans and Policies

The five principal regional planning agencies and their overarching policy plans for the nine-county Bay Area include the ABAG *Projections 2009*, the BAAQMD's *2010 Clean Air Plan*; the Metropolitan Transportation Commission *Regional Transportation Plan – Transportation 2035*; the San Francisco Regional Water Quality Control Board *San Francisco Basin Plan* (Basin Plan), which was adopted in 2007 and amended through 2010; and the San Francisco Bay Conservation and Development Commission (BCDC) *San Francisco Bay Plan*, which was adopted in 1968 and has been periodically amended during the past 40 years. The project is not within BCDC jurisdiction. The proposed project would consist of replacing a susceptible portion of the 36-inch-outside-diameter North Shore Force Main, constructing two underground vaults, and replacing and relocating water mains. All project construction work would be temporary, and, once built, the project would be underground, beneath CCSF streets, and would not adversely change the environment of the surrounding area. The project is located in San Francisco where sewer work within city streets is common. Because of the nature of the proposed project and its relatively small size, there would be no conflicts with regional plans and policies. The project would not result in land use changes in the area. The project would result in temporary and intermittent traffic disruptions during construction and for about one day per year during operations; thus, the project would not have a substantial long-term impact on traffic in the area. In addition, as described in Section E.15, Hydrology and Water Quality, the project would not violate water quality standards and would therefore be consistent with the Basin Plan.

For the reasons described above, the North Shore to Channel Force Main Project does not conflict with any adopted plans and goals of CCSF, or any regional plans or policies, for the purposes of CEQA.

D. SUMMARY OF ENVIRONMENTAL EFFECTS

The proposed project could potentially affect the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

- | | | |
|---|--|--|
| <input type="checkbox"/> Land Use | <input checked="" type="checkbox"/> Air Quality | <input checked="" type="checkbox"/> Biological Resources |
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Geology and Soils |
| <input type="checkbox"/> Population and Housing | <input type="checkbox"/> Wind and Shadow | <input type="checkbox"/> Hydrology and Water Quality |
| <input checked="" type="checkbox"/> Cultural and Paleo. Resources | <input type="checkbox"/> Recreation | <input type="checkbox"/> Hazards/Hazardous Materials |
| <input type="checkbox"/> Transportation and Circulation | <input type="checkbox"/> Utilities and Service Systems | <input type="checkbox"/> Mineral/Energy Resources |
| <input checked="" type="checkbox"/> Noise | <input type="checkbox"/> Public Services | <input type="checkbox"/> Agricultural and Forest Resources |
| | | <input checked="" type="checkbox"/> Mandatory Findings of Significance |

This initial study examines the proposed project to identify potential effects on the environment. For each item on the Initial Study checklist, the evaluation has considered the impacts of the proposed project both individually and cumulatively. All items on the Initial Study Checklist that have been checked "Less than Significant Impact with Mitigation Incorporated," "Less than Significant Impact," "No Impact" or "Not Applicable," indicate that, upon evaluation, staff has determined that the proposed project could not have a significant adverse environmental effect relating to that issue. A discussion is included for those issues checked "Less than Significant Impact with Mitigation Incorporated" and "Less than Significant Impact" and for most items checked with "No Impact" or "Not Applicable." For all of the items checked "No Impact" or "Not Applicable" without discussion, the conclusions regarding potential significant adverse environmental effects are based upon field observation, staff experience and expertise on similar projects, and/or standard reference material available within the Planning Department, such as the Department's *Transportation Impact Analysis Guidelines for Environmental Review*, or the California Natural Diversity Data Base and maps, published by the California Department of Fish and Game. For each checklist item, the evaluation has considered the impacts of the project both individually and cumulatively. The items checked above have been determined to be "Less than Significant with Mitigation Incorporated."

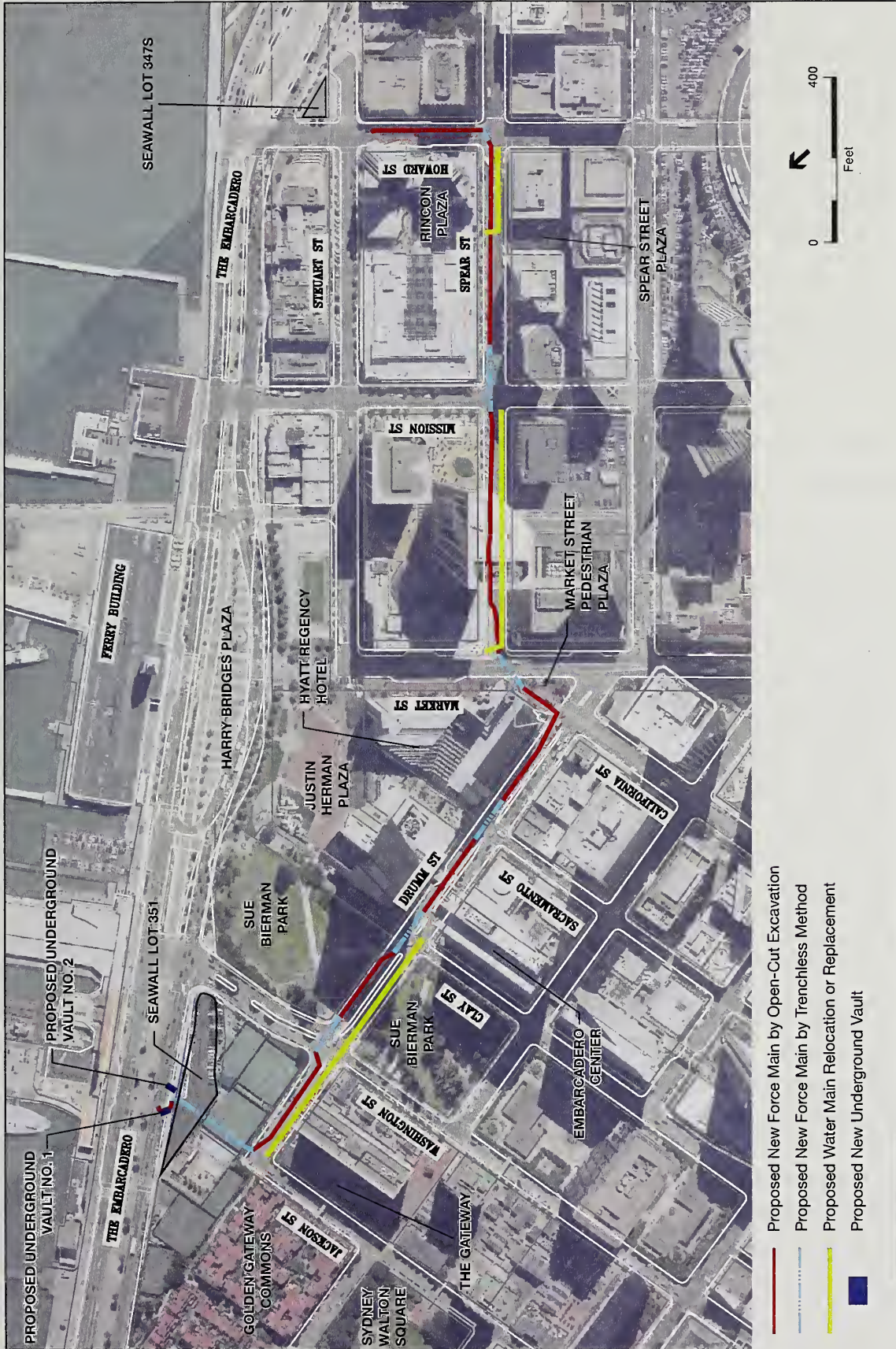
E. EVALUATION OF ENVIRONMENTAL EFFECTS

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
1. LAND USE AND LAND USE PLANNING – Would the project:					
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial impact upon the existing character of the vicinity?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact LU-1: The proposed project would not physically divide an established community. (Less than Significant)

The proposed project is located entirely within CCSF. The new force main would be constructed primarily within existing streets and utility corridors that are within and adjacent to a high-density residential-commercial combined district, public use district, and downtown office and commercial districts. As shown in Figure 7, the northernmost segment of the new force main traverses land occupied by the Golden Gateway Tennis & Swim Club, which operates a fitness center, tennis courts, and pool. The land directly to the northwest and west of the pipeline alignment beneath Drumm Street is occupied by high-density residential communities including the Golden Gateway Commons and the Gateway. The privately owned Sydney G. Walton Square (Walton Park) is situated west of the Golden Gateway Commons and is open to the public. Other lands adjacent to the pipeline alignment along Drumm Street include Sue Bierman Park (operated and maintained by the San Francisco Recreation and Parks Department), the Embarcadero Center, the Hyatt Regency Hotel, and other downtown office and commercial uses.

At the corner of California and Market Streets, the pipeline would cross the Market Street pedestrian plaza (between the California Street cable car turnaround and the Hyatt Regency Hotel), continue southeast along Spear Street, and terminate at Howard and Steuart Streets. South of Market Street, downtown office and commercial land uses are adjacent to the project alignment. Among these are Rincon Center, a complex of shops, restaurants, offices, and apartments. Open space areas along Spear



SOURCE: San Francisco Department of Public Works

North Shore to Channel Force Main

Figure 7

Land Use Features in the Project Site Vicinity

Street include Rincon Plaza and Spear Street Plaza, which offer bench seating and are commonly used by downtown workers during lunchtime hours.

During construction, most of the pipeline would be installed using open-trench construction methods. Approximately 525 linear feet of the pipeline would be installed using the trenchless construction method. This includes the segment beneath the former Jackson Street right-of-way, the intersections along Drumm Street and Spear Street, and a portion of the alignment between the Market Street pedestrian plaza and Spear Street, as described in Section B, Project Description.

During construction, staging areas would be required for stockpiling supplies and equipment close to the construction area. Staging areas would be located within the parking lanes and work areas along the pipeline alignments, and off-site staging areas would be located at the Port of San Francisco's Seawall Lot 347S at Howard and Steuart Streets, and at the SFPUC Bruce Flynn Pump Station Yard which is located between Evans Avenue and Davidson Street. Additional off-site staging areas might include the sidewalk area at the vault locations along The Embarcadero, SFPUC North Point Wet Weather Facility, SFPUC Drumm Street Pump Station, and/or the Port of San Francisco's Seawall Lot 351, depending on the availability of space.

The peak-period lane on The Embarcadero (which functions as a third southbound lane during commute hours), one southbound traffic lane and the bike lane would be closed for up to 5 weeks during construction of Vault No. 1 and installation of road decking and paving restoration. Once the road decking is in place, traffic would resume above the vault excavation, and two traffic lanes would be open but the southbound peak-period lane and bicycle lane would remain closed for the entire 3-month duration of vault construction. The southbound peak-period lane, traffic lane, and bicycle lane would be closed for up to one week to remove the decking and repair the pavement once construction of the vault is complete. Subsequent construction of Vault No. 2 would require temporary closure of the southbound peak-period lane, bicycle lane, and sidewalk on The Embarcadero for up to 2 months. Overall pipeline installation work is expected to last 13 months, water main replacement work would require 1 month, and water main relocation work would require 2 months. Once construction is complete, the pavement would be restored in the affected areas, and there would be no long term changes affecting access to adjacent land uses.

As discussed in Section E.5, Transportation and Circulation, local access along the project alignment would be maintained during the 14-month construction period for residents, businesses, and emergency vehicles. At the Market Street pedestrian plaza, the SFPUC would require the contractor to conduct construction work in a manner that would not disrupt operation of the California Street cable car or

access to and from the Hyatt Regency Hotel or hotel operations. Once construction is complete, the new force main and vaults would be underground and would not disrupt, physically divide, or isolate surrounding communities. In summary, local access would be maintained during short-term construction activity. Further, no changes would be made to the existing street network, and no permanent aboveground facilities would be constructed. Therefore, impacts related to the physical division of an established community would be *less than significant*.

Impact LU-2: The proposed project would be consistent with applicable land use plans, policies, and regulations of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. (No Impact)

The proposed project would not conflict with applicable plans, policies, and regulations such that an adverse physical change would result, as discussed in Section C, Compatibility with Zoning, Plans, and Policies. Therefore, there would be *no impact*.

Impact LU-3: The proposed project would not have a substantial impact upon the existing character of the vicinity. (Less than Significant)

The proposed project would not construct any aboveground facilities, and would construct underground facilities primarily beneath street rights-of-way owned by the CCSF and adjacent to high-density commercial-residential, public recreational, and downtown and commercial districts, as described in Impact LU-1. The segment of the new force main partially within the easement beneath the former Jackson Street right-of-way and partially within City property would be installed within an existing box sewer using trenchless construction methods. Although the proposed project would result in temporary disruption to the character of the project vicinity as a result of construction staging, excavation, and pipeline installation activities, once construction is complete, the below ground facilities would not be visible and would have no effect on the character of the surrounding area. Therefore, the proposed project would have a *less-than-significant* impact on the existing character of the project vicinity.

Impact C-LU: The proposed project, in combination with past, present and reasonably foreseeable future projects in the vicinity of the site, would not result in significant cumulative impacts related to land use. (Less than Significant)

Land use impacts that could result from the proposed project are limited to the immediate vicinity of the project area. Therefore, the geographic scope of potential cumulative impacts on land use includes the project area and adjacent properties.

As summarized in Table 3, other reasonably foreseeable projects in the vicinity of the proposed project with the potential to contribute to cumulative land use impacts consist of: various Port of San Francisco improvement projects, the 8 Washington Street/Seawall Lot 351 project, the 34th America's Cup (AC34) project, the James R. Herman Cruise Terminal and Northeast Wharf Plaza project, the SFDPW pavement renovation project, the Exploratorium Relocation project at Piers 15-17, the San Francisco Bicycle Plan, and other mixed-use developments. Of these projects, the 8 Washington/Seawall Lot 351 project, a bicycle lane improvement project (part of the San Francisco Bicycle Plan), the Exploratorium Relocation project at Piers 15-17, and AC34 dredging activities at Piers 14-22 ½ open water basin would be within 1,000 feet of the project area and would include construction activities during the same timeframe as proposed project construction that could also affect the same nearby land uses, a potentially significant cumulative land use impact. However, such impacts would consist of temporary construction-related disruption, and as discussed in Impacts LU-1 and LU-3, the North Shore to Channel Force Main Project would not divide an established community or cause a significant adverse change in land use character in the project vicinity and thus would not substantially contribute to overall cumulative changes in land use character or division of a community. Further, the proposed project would not conflict with applicable environmental plans or policies as discussed in Impact LU-2. Therefore, the proposed project's contribution to cumulative impacts related to land use would not be cumulatively considerable (*less than significant*).

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
2. AESTHETICS—Would the project:					
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and other features of the built or natural environment which contribute to a scenic public setting?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area or which would substantially impact other people or properties?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact AE-1: The proposed project would not have a substantial adverse effect on scenic vistas or scenic resources. (No Impact)

The project area is adjacent to The Embarcadero, which offers panoramic views of the waterfront and bay, but there are no designated scenic vistas, scenic resources, or designated scenic roadways along the project alignment. Although project construction activities would be visible in the vicinity of the affected streets – The Embarcadero, Drumm Street, Spear Street, and Howard Street – as well as intersecting streets, these temporary activities would not result in permanent changes in views of any scenic vistas or scenic resources. Furthermore, construction in any one area would generally be limited to several months and for residents and workers along the project alignment, views of the construction activities would be temporary, and a pedestrian or motorist's view of the construction areas while passing by on these streets would be brief. Once the new force main and vaults are installed, all affected streets would be restored and views would be similar to existing conditions. For these reasons, there would be *no impact* on scenic vistas or scenic resources.

Impact AE-2: The proposed project would not substantially degrade the existing visual character or quality of the site and its surroundings. (Less than Significant)

The visual character of the project area and the surrounding setting varies. The northern portion of the project area is situated in a high-density residential community surrounded by commercial uses and a landscaped public open space area at Sue Bierman Park. Farther to the south, the project area is characterized by a combination of high-rise office buildings and commercial uses. As described in Impact AE-1, construction of the North Shore to Channel Force Main project would be visible from affected streets – The Embarcadero, Drumm Street, Market Street, Spear Street, and Howard Street – as well as intersecting streets throughout the 14-month construction phase.

Downtown workers, residents, pedestrians, and motorists traveling on affected streets would have brief views of construction activities, including open-cut excavation work, excavation for the ramming and receiving pits, water main replacement and relocation, and repaving; and of construction equipment and materials. However, these views would be limited to the temporary construction period (3 months at Vault No. 1; 2 months at Vault No. 2; 2.5 months for trenchless construction activities at each intersection along Drumm Street and Spear Street; and 4 weeks for trenchless construction at the Market Street and Spear Street intersection). Similarly, recreationists at Sue Bierman Park, Rincon Plaza, and Spear Street Plaza would have short-term views of the abovementioned construction activities and associated

equipment and materials. **Figure 8a**, photo 1, shows representative views of the project area from Sue Bierman Park and Drumm Street.

Although there are no designated landmark or significant trees within or adjacent to the project alignment, the street trees within the project vicinity contribute to the area's visual character. As described in Section B, Project Description, and in Section E.13, Biological Resources, the proposed project would require the removal of two street trees: one Brazilian pepper tree located at the intersection of Jackson and Drumm Streets, and a London plane tree located in the Market Street pedestrian plaza. As shown in **Figure 8a**, photo 2, the tree located at Jackson and Drumm Streets is surrounded by many other street trees along Drumm Street. Similarly, there are several other trees in the vicinity of the tree proposed for removal in the Market Street pedestrian plaza (see **Figure 8b**, photo 3). Although removal of these trees might be noticeable, it would not substantially alter the visual character of these areas because of the numerous other street trees along these streets and because the two removed trees would be replaced at a later time in accordance with CCSF's Urban Forestry Ordinance (see Section E.13, Biological Resources, for additional information regarding this ordinance). As described in Section B, Project Description, the project includes planting of one additional new tree on The Embarcadero to replace a tree previously removed by SFPUC.

Once construction is complete, all project components would be below ground and would not be visible. Because construction activities would be visible only for short durations, project construction would not substantially change the overall visual character of the project vicinity. In addition, removed street trees would be replaced. Therefore, impacts related to degradation of the existing visual character or quality of the site and its surroundings would be *less than significant*.

Impact AE-3: The proposed project would not create a new source of light and glare. (Less than Significant)

For the majority of the 14-month construction duration, construction activities would occur on weekdays from 7:00 a.m. to 6:00 p.m. Construction activities along Drumm Street between California and Sacramento Streets would be restricted to the weekends between 9:00 a.m. and 6:00 p.m. to avoid conflicts with Muni Bus Lines No. 1 and No. 41. However, up to 5 weeks of 24-hour construction could be required for construction of Vault No. 1, including the construction of roadway decking on The Embarcadero; in addition, up to 6 (non-consecutive) 24-hour days could be required for Vault No. 1 construction and tie-in to the existing force main; and up to 2 (non-consecutive) 24-hour days could be



Photo 1: West facing view of the project alignment from Sue Bierman Park near the Drumm Street and Clay Street intersection.



Photo 2: South facing view of the tree proposed for removal (in the foreground) at the Drumm Street and Jackson Street intersection.



Photo 3: East facing view of the tree proposed for removal (to the right) in the Market Street pedestrian plaza.



Photo 4: Northwest facing view of the vault construction work area from the southbound side of The Embarcadero.

SOURCE: ESA

North Shore to Channel Force Main

Figure 8b
Representative Photos of the Project Area

required for Vault No. 2 construction and tie-in to the existing force main. Except for these 24-hour construction periods, the project would not create a new source of light or glare.

Temporary lighting for nighttime construction activities near Vaults No. 1 and 2 would primarily be visible from The Embarcadero and, to a lesser extent, from the apartment units at the four-story Golden Gateway Commons, located approximately 320 feet west of Vault No. 1. As shown in Figure 8b, photo 4, the fencing and shrubbery around the Golden Gateway tennis courts would largely shield residents in the lower levels of the Golden Gateway Commons (shown to the left in photo 4) from nighttime project lighting. Temporary lighting would also be used during installation of the sandbags at the Jackson Street and Sansome Street intersection prior to the shutdowns of the North Shore Force Main and North Shore Pump Station. At both project locations, temporary lighting would be directed downward, as described in Section B, Project Description, to ensure safe illuminated areas for construction workers and to minimize glare effects on surrounding property owners and drivers along The Embarcadero, Sansome Street and Jackson Street. Because the nighttime construction activities would be of short duration, views of the vault sites would be obstructed by the Golden Gateway tennis courts and fencing, and nighttime and temporary lighting would be directed downward, any adverse effects would not be substantial. Therefore, impacts related to temporary construction lighting would be *less than significant*.

Impact C-AE: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not have a significant impact on aesthetics. (Less than Significant)

The geographic scope of potential cumulative impacts on aesthetic resources encompasses the project area and immediately adjacent areas. The North Shore to Channel Force Main Project, as well as other projects listed in Table 3, would result in a significant cumulative impact on scenic resources and the visual character of the area if these projects were to adversely affect the same scenic resources.

Visual Character of the Site and Its Surroundings

As discussed in Impact AE-2, construction of the North Shore to Channel Force Main Project would result in short-term visual changes but would not substantially alter the visual character of the project site and its surroundings. Construction of the 8 Washington Street/Seawall Lot 351 project and the Howard Street bicycle lane project (part of the San Francisco Bicycle Plan) would also be visible from streets affected by the North Shore to Channel Force Main Project. Because the 8 Washington Street/Seawall Lot 351 project schedule would overlap the proposed project's schedule, downtown workers, residents, motorists and

pedestrians traveling on The Embarcadero, Drumm Street, and adjacent streets might have temporary views of construction activities associated with both projects. Both the proposed project and the 8 Washington Street/Seawall Lot 351 project would also include removal of street trees, which could be noticeable for a temporary period. However, all trees affected by cumulative construction activity would be replaced in accordance with San Francisco's Urban Forestry Ordinance. Due to the short term nature of the visual change, aesthetic impacts associated with cumulative construction activity would be *less than significant*.

New Source of Light or Glare

Vault No. 1 could require up to 5 weeks of 24-hour construction, with nighttime lighting that could be visible to nearby residents at the Golden Gateway Commons and motorists traveling along The Embarcadero. However, as described under Impact AE-3, because the nighttime construction work would be of short duration, the Golden Gateway tennis courts and fencing would obstruct views of the vault site, and nighttime lighting would be directed downward, the proposed project would have a less-than-significant effect. None of the cumulative projects listed in Table 3, including the 8 Washington/Seawall Lot 351 project, would require nighttime construction work or lighting in the vicinity of the North Shore to Channel Force Main project. Therefore, there would be no cumulative impacts related to construction-related nighttime lighting.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
3. POPULATION AND HOUSING— Would the project:					
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Displace substantial numbers of existing housing units or create demand for additional housing, necessitating the construction of replacement housing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact PH-1: The proposed project would not induce substantial population growth in San Francisco, either directly or indirectly. (No Impact)

The purpose of the proposed project is to bypass a susceptible segment of the existing 36-inch-outside-diameter North Shore Force Main to prevent potential discharge of untreated wastewater to the San Francisco Bay and to provide a redundant pipeline that allows the existing force main to be taken off line for repairs with minimal disruption to service. The new North Shore to Channel Force Main would have a capacity of 35 mgd, about the same as the existing North Shore Force Main, and neither the new force main nor associated vaults would increase sewage transmission or treatment capacities. As such, the proposed project would not induce growth, either directly or indirectly. Therefore, the proposed project would have *no impact* related to population growth.

Impact PH-2: The proposed project would not displace substantial existing housing units or create demand for additional housing, necessitating the construction of replacement housing. (No Impact)

The project would be implemented within San Francisco street rights-of-way, except for the 205-foot segment beneath the former Jackson Street right-of-way, which is partially within an easement and partially within City property, and staging areas that would be constructed on CCSF property where there is no housing. Further, as described in Impact PH-2, the new force main would have about the same capacity as the existing North Shore Force Main and would not induce population growth that could create a demand for housing. Therefore, the project would have *no impact* related to displacement of housing or the need for additional housing.

Impact PH-3: The proposed project would not displace substantial numbers of people, necessitating the construction of replacement housing. (No Impact)

As described in Impact PH-2, the project would be implemented within San Francisco street rights-of-way, except for the 205-foot segment beneath the former Jackson Street right-of-way, which is partially within an easement and partially within City property, and staging areas that would be constructed on CCSF property where there is no housing. No people would be displaced for construction of the project. Therefore, the project would have *no impact* related to displacement of people or the need for replacement housing.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
4. CULTURAL AND PALEONTOLOGICAL RESOURCES— Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Approach to Analysis

This section was completed with guidance from the *Archeological Notes to Accompany the Preliminary Archeological Review for the SFPUC North Shore to Channel Force Main Sewer Project* (Dean, 2011a) and the *Environmental Planning Preliminary Archeological Review: Checklist* (Dean, 2011b), both prepared by the San Francisco Planning Department, Environmental Planning Division. A CEQA Area of Potential Effects (C-APE) has been identified that comprises areas that would be subject to direct and indirect effects from the proposed project. Both a vertical (0 to 23 feet below ground surface) and horizontal (8.5 to 23 feet) C-APE have been delineated. All open-trench and vault excavation construction work would take place within existing streets; pipe ramming would be used through street intersections; and within the sewer easement and City property along the former route of Jackson Street, the new force main would be installed entirely within the existing Jackson Street transport structure. Hand mining would be conducted between the Market Street pedestrian plaza and Spear Street. There are no buildings or structures within the C-APE, and the proposed project would have no direct impact on any buildings or structures adjacent to the C-APE; however, the potential for indirect effects resulting from vibrations associated with pipe ramming is addressed in the impact discussion below.

Based on the Planning Department's review of information from the CCSF's Archeo Geographic Information System (GIS) Maritime Project (a GIS mapping that shows all buried ships, storeships, and shipwrecks in San Francisco that have been documented, confirmed, conjectured by scholars, or are best

estimations by the Planning Department), the proposed project has the potential to affect archeological remains associated with the Gold Rush-era ship *Henry* as well as the Commercial Street Wharf (constructed in 1852). Potential impacts to these archeological resources are addressed below.

Historic Context

The project area is located in an area that historically was submerged within an embayment of the San Francisco Bay known as Yerba Buena Cove. The proposed project alignment is 1/6th to 1/3rd mile from the historic (c. 1850) shoreline of Yerba Buena Cove. Since the late Pleistocene, when indigenous peoples may have first arrived in the San Francisco Bay Area (Bay Area), the region has undergone significant environmental changes as a result of global climate fluctuations, including rising sea levels and changes in the distribution and availability of natural resources. Beginning around 11,000 years before present (BP), as the colder Pleistocene geological era gave way to the warmer Holocene era, the broad inland valley now forming San Francisco Bay was progressively inundated and the coastal shoreline receded from the Farallon Islands to its current location 27 miles to the east. Older archeological sites at lower elevations within the Bay would have been submerged by rising sea levels or buried beneath sedimentary deposits until the beginning of the Late Holocene, as evidenced by discoveries of prehistoric human remains in submerged contexts at Treasure Island and off the bay shoreline of San Mateo County.

By the time of the first Spanish explorations of the San Francisco Bay, Ohlone-speaking tribal groups occupied the area from the Pacific Coast to the Diablo Range and from San Francisco to Point Sur. Prehistorians differ as to when Ohlone populations arrived in the Bay Area although a commonly held view is that they arrived around 4,000 BP. The Ohlone are thought to have introduced a language, cultural patterns, and mortuary practices quite distinct from that of the older Hokan-speaking populations, who had already been present in much of the region for several thousand years. The Ohlone group that occupied the northern end of the San Francisco peninsula during the late 18th century is known under the general term *Yelamu*. The *Yelamu* were divided into three semi-sedentary village groups, occupying at least five seasonal settlements (*Chutchi*, *Sitlintac*, *Amuctac*, *Tubsinte*, and *Petlenuc*) that were located within present-day San Francisco. The *Yelamu* were allied by marriage to Ohlone groups on the east side of San Francisco Bay.

Less than two months after Spanish explorers began construction of the first Mission Dolores, all of the *Yelamu* villages in San Francisco were attacked and burned by an expedition sent by the *Ssalson* tribe, an Ohlone group from the San Mateo area. The *Yelamu* survivors abandoned all of the San Francisco

settlements, seeking refuge with other groups in East Bay and Marin. Until they were missionized in the late 18th century, the *Yelamu* only returned to San Francisco for occasional hunting.

Historically, the proposed project alignment was submerged within Yerba Buena Cove, which at low tide was largely exposed mud flats near its inner shoreline at Montgomery Street. Even before the Gold Rush, the military governor General Kearny released title to the tidelands of the cove to the City of San Francisco for sale of water lots to raise revenue for the construction of streets and public piers. That year, the City of San Francisco sold off 444 water lots, which had the effect of pushing the development of pile-supported timber platform streets/piers and buildings further to the east. The revenue generated did not result in public-constructed and maintained piers. Throughout the Gold Rush, there was no systematic effort to landfill the water lots within the cove, because, in the absence of a retaining bulkhead, tidal action and currents weakened the stability of land-filled lots. The practices of dumping refuse and surplus or damaged cargo off the sides of wharves and out of buildings may have improved the effectiveness of filling in water lots, as did the collapse of large numbers of buildings and wharves into the cove waters in the six catastrophic fires of 1850-1855.

The proposed project alignment was probably not filled in until after the construction of Sections 2 and 3 of the Old Seawall north of Market Street in 1867 and the completion of Section 4 between Market Street and a point just north of Howard Street in 1868. The Old Seawall followed an alignment generally along the western edge of The Embarcadero public right-of-way between Howard and Pacific Streets. The street rights-of-way followed by the proposed project were laid out and dedicated following the construction of the Old Seawall and the filling of Yerba Buena Cove. The buildings that currently exist in the project vicinity were constructed throughout the 20th century, after the earthquake and fire of 1906 that destroyed large parts of CCSF.

Impact Analysis

Impact CP-1: The proposed project could cause a substantial adverse change in the significance of a historic resource as defined in CEQA Guidelines Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code. (Less than Significant with Mitigation)

There are no buildings or structures within the proposed project alignment, so the project would have no potential to directly affect historic resources of the built environment as defined in CEQA Guidelines Section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code (archeological resources that are considered historic resources for the purposes of CEQA are

discussed below in Impact CP-2). Based on review of the City's parcel database (CCSF, 2012), The Rincon Center at 121 Spear Street is a Historic Landmark pursuant to Article 10 of the San Francisco Planning Code and the Southern Pacific Building at One Market is a potential historic resource. These buildings could be subject to vibration from construction activities as discussed in Section E.6, Noise, Impact NO-2. If the vibration caused damage to a character defining feature of a historic resource listed in or eligible for listing in a federal, state, or local register, vibration-related impacts would be *significant*. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-CP-1, Construction Monitoring Program for Historic Resources**, which would require the SFPUC to implement a monitoring program to minimize damage to adjacent historic buildings.

M-CP-1 Construction Monitoring Program for Historic Resources.

The SFPUC shall undertake a monitoring program to minimize damage to adjacent historic buildings and to ensure that any such damage is documented and repaired. The monitoring program shall require the SFPUC to engage a historic architect or qualified historic preservation professional to undertake a preconstruction survey of historic resource(s) identified by the Planning Department adjacent to the project alignment and photograph the buildings' existing conditions prior to the start of any ground-disturbing activity. Based on the construction and condition of the resource(s), a vibration consultant shall also establish a maximum vibration level that shall not be exceeded at each building, based on existing conditions, character-defining features, soils conditions, and anticipated construction practices (a common standard is 0.2 inches per second, peak particle velocity). To ensure that vibration levels do not exceed the established standard, the SFPUC shall require the contractor to monitor vibration levels at each structure and shall prohibit vibratory construction activities that generate vibration levels in excess of the standard.

Impact CP-2: The proposed project could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines Section 15064.5. (Less than Significant with Mitigation)

Standards of Significance

CEQA requires that a project's effects on an archeological resource shall be taken into consideration and that if a project might affect an archeological resource, it shall first be determined whether the archeological resource is a "historical resource," that is, whether the archeological resource meets the criteria for listing in the California Register of Historical Resources (CRHR). To be eligible for listing in the CRHR under Criterion 1, 2, or 3, an archeological site must contain artifact assemblages, features, or stratigraphic relationships associated with important events, or important persons, or that are exemplary of a type, period, or method of construction (CEQA Guidelines Section 15064.5[a][1] and [3] and [c][1])

and [2]). To be eligible under Criterion 4, an archeological site must show the potential to yield important information (United States Department of the Interior, 1990). An archeological resource that qualifies as a “historical resource” under CEQA generally qualifies for listing under Criterion 4 of the CRHR (CEQA Guidelines Section 15064.5 [a][3][D]). An archeological resource may qualify for listing under Criterion 4 if the resource has the potential to significantly contribute to questions of scientific/historical importance. The research value of an archeological resource can only be assessed within the context of its historical background and prior archeological research related to the property type represented by the resource (CA OHP, 1991).

Expected Archeological Property Types

Prehistoric Period

Although the earliest prehistoric sites discovered to date in San Francisco are burial-related (SFR-28 is an isolated human burial, the sub-midden component of SFR-4 is a cemetery), occupation sites are documented as early as 2200 BP (CA-SFR-113) and 1810 BP (midden component of SFR-4). The greatest concentration of prehistoric sites in San Francisco is in the South of Market neighborhood (SOMA) and the Hunters Point-Bayview-Visitation Valley area. These locations tend to be relatively near the historical bay shoreline, estuaries, freshwater/tidal wetlands, or streams. Most of these sites are multi-component shell midden or shell mound sites that indicate permanent or semi-permanent settlements and might also have had symbolic functions. These sites were frequently in use for periods of several hundred years. Prehistoric sites, including some occupation sites, are also located along the northern bay shore, and in the Lake Merced area, Mid-Market area, and on Yerba Buena Island. Many of these sites were resource-processing sites that were occupied for relatively brief periods. The relative scarcity of early prehistoric sites is, in part, the result of rising sea levels during the Holocene period and alluvial deposition that may have submerged or buried older prehistoric sites.

Archeologists consider it curious that no documented intact prehistoric archeological sites have been discovered in the historical heart of San Francisco. Although the area around Yerba Buena Cove appears to have been hospitable for prehistoric occupation, with ready access to the bay and to preferred dietary and non-dietary natural resources, only a few prehistoric isolates of worked stone or cores (basalt, obsidian) have been found to date in this part of San Francisco. It is possible that almost no evidence of prehistoric populations, other than poorly provenienced lithic isolates, has been found within San Francisco’s historical core between Market Street and North Beach not because no populations

inhabited this area but because the archeological evidence of their presence might have been destroyed by the intense development that has characterized this part of San Francisco since the mid-19th century. It is possible that remains of prehistoric populations are present within the former shoreline of Yerba Buena Cove and are buried beneath or within marine sediments and historic fill. Such deposits would likely be at depths below those that would be reached during the proposed project.

Historic Period

The CCSF Archeo GIS Maritime Project includes maps of all buried ships, storeships, and shipwrecks in San Francisco that have been documented, confirmed, conjectured by scholars, or are best estimations by the Environmental Planning Division. The project alignment does not intersect with any known buried ships, storeships, or shipwrecks identified on the maps or in the catalogs of the Archeo GIS Maritime Project. However, the section of the project along Drumm Street and north of California Street is near an area expected to contain the remains of a Gold Rush-period ship known as the *Henry*. If the *Henry* was not previously removed, its expected location is west of Drumm Street along and to the north of California Street, near the project area which is located on the east side of Drumm Street).

By 1857, wharves along this part of the waterfront extended out from filled-in land or were completely built over pile-supported platforms east of the project alignment. Thus, it seems likely that older sections of these wharves that were west of these locations had been dismantled. The proposed project alignment is not expected to intersect the remains of any 19th-century wharves, with one exception – the Commercial Street Wharf, one of the wharves constructed in early Gold Rush San Francisco built by 1852. The Commercial Street Wharf intersects the project alignment on Drumm Street at the mid-point between Sacramento and Clay Streets. It is not known whether any portions of this wharf remain and whether project excavation has the potential to affect remains of this wharf, but in the absence of clear documentation to the contrary, this potential should be presumed.

The project alignment is completely within what would have been the improved public right-of-way of streets, with the exception of the project section through the former Jackson Street right-of-way. This section would not entail any excavation because new pipe would be installed in this section through an existing sub-grade box sewer. Any wharves that existed after the Old Seawall was constructed in 1867 and that might intersect the project alignment would have had their decks and stringers dismantled. The project would have no effect on the archeological record dating from the late 19th century to the present.

Because there is a possibility of encountering buried historic-period archeological resources that might qualify as significant resources under the CEQA definitions above, impacts on archaeological resources would be *significant*. Implementation of **Mitigation Measure M-CP-2a, Accidental Discovery of Archaeological Resources** and **Mitigation Measure M-CP-2b, Archeological Resource Monitoring** would reduce this impact to a *less-than-significant* level by requiring implementation of an archaeological monitoring program under the supervision of a qualified archaeologist and a data recovery program for significant archaeological resources identified during construction.

Following installation of the new force main and vaults, the contractor would backfill excavations and restore the pavement in the affected areas, and there would be no further soil disturbance. Therefore, there would be no potential to encounter archaeological resources during operation of the proposed project.

Mitigation Measure M-CP-2a: Accidental Discovery of Archeological Resources.

The following mitigation measure is required to avoid any potential adverse effect from the proposed project on accidentally discovered buried or submerged historical resources as defined in *CEQA Guidelines* Section 15064.5(a)(c). The SFPUC shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor and require the prime contractor to distribute it to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms) or utilities firm involved in soils disturbing activities within the project site. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel including, machine operators, field crew, pile drivers, supervisory personnel, etc. The SFPUC shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the ERO confirming that all field personnel have received copies of the Alert Sheet.

Should any indication of an archeological resource be encountered during any soils disturbing activity of the project, the project Head Foreman and/or SFPUC shall immediately notify the ERO and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

If the ERO determines that an archeological resource may be present within the project site, the SFPUC shall retain the services of a qualified archaeological consultant, based on standards developed by the Planning Department archaeologist. Selection of the archaeological consultant shall be subject to ERO approval. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional measures to be implemented by the SFPUC.

Measures might include: preservation in situ of the archeological resource; an archaeological monitoring program; or an archaeological testing program. If an archaeological monitoring program or archaeological testing program is required, it shall be consistent with the Environmental Planning division guidelines for such programs. The ERO may also require that the SFPUC immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions.

The project archeological consultant shall submit a Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describing the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO, copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD three copies of the FARR along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Mitigation Measure M-CP-2b: Archeological Resource Monitoring.

Based on the reasonable potential that archeological resources may be present within the project site, the following measures shall be undertaken to avoid any potentially significant adverse effect from the proposed project on buried or submerged historical resources. The SFPUC shall retain the services of a qualified archaeological consultant, based on standards developed by the Planning Department archaeologist. Selection of the archaeological consultant shall be subject to ERO approval. The archeological consultant shall undertake an archeological monitoring program. All plans and reports prepared by the consultant as specified herein shall be submitted first and directly to the ERO for review and comment, and shall be considered draft reports subject to revision until final approval by the ERO. Archeological monitoring and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of *construction* can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines Section 15064.5 (a)(c).

Archeological monitoring program (AMP). The archeological monitoring program shall minimally include the following provisions:

- The archeological consultant, SFPUC, and ERO shall meet and consult on the scope of the AMP reasonably prior to any project-related soils disturbing activities commencing. The ERO in consultation with the project archeologist shall determine what project activities shall be archeologically monitored. In most cases, any soils disturbing activities, such as demolition, foundation removal, excavation, grading, utilities installation, foundation work, driving of

piles (foundation, shoring, etc.), site remediation, etc., shall require archeological monitoring because of the potential risk these activities pose to archaeological resources and to their depositional context;

- The archeological consultant shall advise all project contractors to be on the alert for evidence of the presence of the expected resource(s), of how to identify the evidence of the expected resource(s), and of the appropriate protocol in the event of apparent discovery of an archeological resource;
- The archaeological monitor(s) shall be present on the project site according to a schedule agreed upon by the archeological consultant and the ERO until the ERO has, in consultation with the archeological consultant, determined that project construction activities could have no effects on significant archeological deposits;
- The archeological monitor shall record and be authorized to collect soil samples and artifactual/ecofactual material as warranted for analysis;
- If an intact archeological deposit is encountered, all soils disturbing activities in the vicinity of the deposit shall cease. The archeological monitor shall be empowered to temporarily redirect demolition/excavation/pile driving/construction crews and heavy equipment until the deposit is evaluated. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the pile driving activity shall be terminated until an appropriate evaluation of the resource has been made in consultation with the ERO. The archeological consultant shall immediately notify the ERO of the encountered archeological deposit. The archeological consultant shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archeological deposit, present the findings of this assessment to the ERO.

If the ERO in consultation with the archeological consultant determines that a significant archeological resource is present and that the resource could be adversely affected by the proposed project, at the discretion of the SFPUC either:

- A) The proposed project shall be re-designed so as to avoid any adverse effect on the significant archeological resource; or
- B) An archeological data recovery program shall be implemented, unless the ERO determines that the archeological resource is of greater interpretive than research significance and that interpretive use of the resource is feasible.

If an archeological data recovery program is required by the ERO, the archeological data recovery program shall be conducted in accord with an archeological data recovery plan (ADRP). The project archeological consultant, SFPUC, and ERO shall meet and consult on the scope of the ADRP. The archeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures.* Descriptions of proposed field strategies, procedures, and operations.
- *Cataloguing and Laboratory Analysis.* Description of selected cataloguing system and artifact analysis procedures.
- *Discard and Deaccession Policy.* Description of and rationale for field and post-field discard and deaccession policies.
- *Interpretive Program.* Consideration of an on-site/off-site public interpretive program during the course of the archeological data recovery program.
- *Security Measures.* Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- *Final Report.* Description of proposed report format and distribution of results.
- *Curation.* Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains, Associated or Unassociated Funerary Objects. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable State and Federal Laws, including immediate notification of the Coroner of the City and County of San Francisco and in the event of the Coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission (NAHC) who shall appoint a Most Likely Descendant (MLD) (Pub. Res. Code Sec. 5097.98). The archeological consultant, SFPUC, and MLD shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, curation, possession, and final disposition of the human remains and associated or unassociated funerary objects.

Final Archeological Resources Report. The archeological consultant shall submit a Draft Final Archeological Resources Report (FARR) to the ERO that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological testing/monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the draft final report.

Copies of the Draft FARR shall be sent to the ERO for review and approval. Once approved by the ERO copies of the FARR shall be distributed as follows: California Archaeological Site Survey Northwest Information Center (NWIC) shall receive one (1) copy and the ERO shall receive a copy of the transmittal of the FARR to the NWIC. The Environmental Planning division of the Planning Department shall receive of the FARR shall receive one bound, one unbound and one unlocked, searchable PDF copy on CD along with copies of any formal site recordation forms (CA DPR 523 series) and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the ERO may require a different final report content, format, and distribution than that presented above.

Impact CP-3: The proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (Less than Significant)

The project vicinity is urbanized, with concrete, asphalt, or buildings covering nearly the entire surface area. No rock outcrops or exposures of undisturbed sediment are found on or near the project alignment. No unique geologic features are located in the project area.

Geologic materials that underlie the project alignment and would be disturbed by project excavation consist of historic and recent artificial fill overlying thick Bay Mud deposits (SFDPW, 2011a). Construction would take place in relatively flat terrain along existing city streets and would involve vault, trench, and pit excavations from 8.5 to 23 feet wide and 15 to 23 feet deep.

The potential for impacts on paleontological resources is generally rated depending on the resource sensitivity of the affected formations. The specific criteria used in the paleontology sensitivity analysis are summarized below.

High Sensitivity. High sensitivity is assigned to geologic formations known to contain paleontological localities with rare, well-preserved, and/or critical fossil materials for stratigraphic or paleo-environmental interpretation and fossils providing important information about the paleobiology and evolutionary history of animal and plant groups. Generally speaking, highly sensitive formations are known to produce vertebrate fossil remains or are considered to have the potential to produce such remains.

Moderate Sensitivity. Moderate sensitivity is assigned to geologic formations known to contain paleontological localities with moderately preserved fossil material that is common elsewhere or stratigraphically long-ranging. The moderate sensitivity category is also applied to geologic formations that are judged to have a strong but unproven potential for producing important fossil remains.

Low Sensitivity. Low sensitivity is assigned to geologic formations that, based on their relative youth and/or high-energy depositional history, are judged unlikely to produce important fossil remains. Typically, low-sensitivity formations might produce invertebrate fossil remains in low abundance.

Marginal Sensitivity. Marginal sensitivity is assigned to geologic formations that are composed either of pyroclastic volcanic rocks or metasedimentary rocks but nonetheless have a limited probability of producing fossil remains from certain sedimentary lithologies at localized outcrops.

Zero Sensitivity. Zero sensitivity is assigned to geologic formations that are entirely plutonic (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

None of the geologic formations within the project alignment is expected to be high sensitivity. Bay Mud has marginal to low paleontologic sensitivity; therefore, disturbance of this unit has low potential to destroy or damage significant paleontologic resources. The historic artificial fill is classified as low sensitivity because of its already disturbed nature. Old Bay Mud deposits are classified as moderate sensitivity because of the potential for Pleistocene-aged sediments in this unit. However, project excavations would not reach depths at which older Pleistocene-era geologic deposits occur (SFDPW, 2011a). Further, an online search of the paleontologic locality database maintained by the University of California, Berkeley Museum of Paleontology reveals that there are no known paleontological resources within the project alignment (UCMP, 2012). Because of the low likelihood of intersecting fossil-containing beds and the lack of significant fossil discoveries in the project vicinity, adverse impacts on paleontologic resources would be *less than significant*.

Impact CP-4: The proposed project could disturb human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation)

Because the project entails ground disturbance, it is possible, although unlikely, that undiscovered burials could be encountered during construction, which would be a *significant* impact. Implementation of **Mitigation Measures M-CP-2a, Accidental Discovery of Archeological Resources** and **M-CP-2b, Monitoring Archeological Resources** would reduce this impact to a less-than-significant level by ensuring proper treatment of any human burials that might be encountered during excavation.

Impact C-CP: Construction of the proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, could result in a significant cumulative impact on cultural resources. (Less than Significant with Mitigation)

Cultural resource impacts resulting from the project are limited to potential impacts on historic-period archaeological resources that might have been buried along the historic San Francisco waterfront and impacts on human remains. Therefore, the geographic scope for cumulative impacts related to archaeological resources includes the San Francisco waterfront area.

As discussed in Impact CP-2, construction activities associated with the proposed project could result in adverse effects on the remains of a Gold Rush-period ship known as the *Henry* and the Gold Rush-period

Commercial Street Wharf. The 8 Washington Street/Seawall Lot 351 project would involve excavation in the immediate vicinity of the proposed project, but the southern limit of excavation would extend to only Washington Street. Therefore, this project would not be expected to adversely affect either the *Henry* (expected near Drumm and California Streets) or the Commercial Street Wharf (expected along Drumm Street between Sacramento and Clay Streets). However, excavation for the 8 Washington Street/Seawall Lot 351 project as well as other projects listed in Table 3 could encounter other historic-period archaeological resources as well as human remains (Impact CP-4), resulting in a potentially significant cumulative impact on archaeological resources and human remains in the vicinity. The North Shore to Channel Force Main project's contribution to this cumulative impact would be cumulatively considerable. However, the project's impact would be less than significant with implementation of **Mitigation Measure M-CP-2a, Accidental Discovery of Archeological Resources** and **Mitigation Measure M-CP-2b, Archeological Resource Monitoring** which require an archaeological monitoring program under the supervision of a qualified archaeologist and a data recovery program for significant archaeological resources identified during construction as well as proper treatment of any human burials that might be encountered during excavation. With implementation of these measures, the project's residual contribution to impacts on archaeological resources and human remains would not be cumulatively considerable (*less than significant*).

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less Than Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
5. TRANSPORTATION AND CIRCULATION— Would the project:					
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
c) Result in a change in air traffic patterns, including either an increase in traffic levels, obstructions to flight, or a change in location, that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

A Transportation Impact Analysis was prepared for the proposed project (Adavant Consulting, 2012).

Setting

Freeway access to/from the project area and the East Bay (via the Bay Bridge) is provided via an Interstate 80 (I-80) on-ramp at First/Harrison Streets and off-ramp at Fremont/Howard Streets, and an Interstate 280 (I-280) on- and off-ramp at Fifth and King Streets. Local roadways that would be directly or indirectly affected by construction of the project include the following:

The Embarcadero is a two-way north-south roadway that connects Second Street with Taylor Street. It generally has two or three travel lanes each way, with a wide center median for streetcar service. In the vicinity of the project area, The Embarcadero has three northbound travel lanes plus one bicycle lane, and two southbound travel lanes plus one bicycle lane and an additional southbound peak-period lane between Broadway and Mission Streets, available on weekdays during the morning and evening commuter peak traffic periods of 7:00 to 9:00 a.m. and 3:00 to 6:00 p.m. On-street parking is permitted in this southbound peak-period lane during non-commute periods between Broadway and about 300 feet north of Washington Street, and from about 250 feet south of Washington Street to Don Chee Way (the latter being outside the project area).

Drumm Street is a two-way north-south roadway that connects Jackson and Market Streets. Between Market and Washington Streets, Drumm Street has two lanes each way with a raised planted median; between Washington and Jackson Streets, the roadway narrows to one lane each way without a median. On-street parking, commercial loading spaces and motorcycle parking spaces are provided on both sides of the street.

Spear Street is a one-way southbound roadway that connects Market and Harrison Streets, ending in a two-way cul-de-sac immediately south of Harrison Street. On-street parking and commercial and passenger loading spaces are provided on both sides of the street, and motorcycle parking is provided on the west side of the street between Market and Mission Streets.

Howard Street is an east-west roadway that connects The Embarcadero with South Van Ness Avenue. In the vicinity of the project area, Howard Street is a two-way arterial with two travel lanes each way between The Embarcadero and Fremont Street, and a one-way street west of Fremont Street with four westbound travel lanes. On-street parking and commercial and passenger loading spaces are provided on both sides of the street.

Jackson Street operates one-way eastbound between Powell and Front Streets, and two-way (one lane each way) between Front and Drumm Streets.

Washington Street operates two-way between The Embarcadero and Drumm Street, and one-way westbound between Drumm and Powell Streets. Washington Street has two lanes each way between Drumm Street and The Embarcadero, separated by a planted median and on-street parking on both sides.

Clay Street operates one-way eastbound between Drumm Street and Van Ness Avenue. Between Front Street and Davis Street, Clay Street has three traffic lanes with parking provided on the north side of the street. Between Davis and Drumm Streets, Clay Street has one traffic lane (eastbound) plus two-hour parking and loading spaces. East of Drumm Street, Clay Street ends with access only to the Embarcadero Center 4 parking garage.

Sacramento Street operates one-way westbound with one to two travel lanes between Drumm and Gough Streets.

California Street operates two-way with generally two travel lanes. The C-California cable car line runs along California Street between Drumm Street and Van Ness Avenue. In the vicinity of the project area, California Street has one general travel lane each way, with the cable car operating on an exclusive lane in the center of the street.

Market Street operates two-way with generally two travel lanes each way; left-turns are not permitted except at Drumm Street. Streetcars operate two-way on the center lanes, and transit stops are located both at the curb, and at raised islands along the corridor.

Mission Street operates two-way with two travel lanes each way (one each way west of Main Street designated as a transit-only lane weekdays from 7:00 a.m. to 6:00 p.m.). Left turns by vehicles other than buses and taxis are not permitted west of Beale Street.

The San Francisco General Plan designations for roads in the project area include *Major Arterials* (The Embarcadero, and Drumm, Howard, Washington and Clay Streets), *Metropolitan Transportation System roadways* (The Embarcadero, and Drumm, Howard, Market, and Mission Streets), *Transit Preferential Streets* (The Embarcadero, and Drumm, Howard, Washington, Clay, Sacramento, California, Market, and Mission Streets), *Transit Conflict Streets* (Market and Mission Streets), *Neighborhood Pedestrian Streets* (The Embarcadero, and Drumm, Washington, and Sacramento Streets), *Citywide Pedestrian Streets* (California and Market Streets), *Neighborhood Commercial Street* (California Street), and *Citywide Bicycle Routes* (The Embarcadero [No. 5], Howard Street [No. 30], and Market Street [No. 50]).

The project area is well served by local (Muni) and regional (BART, AC Transit, SamTrans, Caltrain, Golden Gate Transit, and ferries serving the East Bay and North Bay) public transit service. Eleven of the 16 Muni lines operating in the project area travel along streets where construction would occur, while the other five travel perpendicular to Drumm or Spear Streets. Three Muni stops are located along the project alignment, at the northeast corner of Drumm and California Streets (serving the 41 Union, 80X Gateway Express and 82X Levi Plaza Express), at the southwest corner of Spear and Market Streets (serving the 2 Clement, 6 Parnassus, 9/9L San Bruno, 21 Hayes and 31 Balboa), and at the northeast corner of Howard and Spear Streets (serving the 30X Marina Express). The above-cited Muni stop at Drumm and California Streets, adjacent to the Hyatt Regency Hotel, is also used by Amtrak's bus service.

All streets in the project area have sidewalks and all intersections have signalized crossings with marked crosswalks. Sidewalks range from 8 to 10 feet wide along most streets, to 10 to 15 feet wide on The Embarcadero, and to 30 to 35 feet wide along Market Street. However, the effective width of each sidewalk is often less due to obstructions such as street trees, lamp posts, newspaper racks, and other objects. During the weekday PM peak hour, 194 pedestrians were observed walking along the west sidewalk of The Embarcadero between Broadway and Washington Street (Adavant Consulting, 2011).

In the vicinity of the project, bicycle routes are interconnected to the Citywide Bicycle Network and provide access between the study area and locations throughout the city. Bicycle Route No. 5 runs on The Embarcadero and is a Class II facility (on-street bicycle lanes), and Bicycle Route No. 30 runs westbound on Howard Street between Steuart and Spear Streets as a Class III facility (signed route only, where bicycles and motor vehicles share the traffic lanes). Eastbound and westbound Market Street is also designated as Class II bicycle facilities (Route No. 50). During the weekday p.m. peak hour, 44 bicyclists were observed traveling along the southbound bicycle lane on the west side of The Embarcadero between Broadway and Washington Street (Adavant Consulting, 2011). About 70 to 75 percent of the total number of southbound bicyclists typically use the bicycle lane, with about 25 to 30 percent utilizing Herb Caen Way (Embarcadero Promenade) next to the waterfront (CCSF, 2011a). The City has adopted a Bicycle Plan that identifies a number of improvement projects for bicycles, including near-term project 2-9 adding a bike lane on Howard Street from The Embarcadero to Fremont Street, and one long-term project (L-1), still in preliminary design, adding Class II or Class III facilities to Battery Street southbound from The Embarcadero to Clay Street.

The existing on-street parking spaces along Drumm and Spear Streets are mostly comprised of commercial metered spaces, with limits ranging from 30 minutes to two hours, white passenger loading

spaces, and a few handicapped spaces. On most streets, the commercial vehicle meters are in effect from 7:00 a.m. to sometime between 3:00 p.m. and 6:00 p.m. weekdays and Saturdays. Two-hour metered general parking is available on both sides of Drumm Street, north of Clay Street. Metered motorcycle spaces are available on the east side of Drumm Street, between Washington and Clay Streets, and on the west side of Spear Street, between Market and Mission Streets. The on-street commercial vehicle loading spaces, metered motorcycle spaces, passenger loading spaces, and general parking spaces are well-utilized throughout the day. There are eight off-peak metered parking spaces on the west side of The Embarcadero within the construction area and 14 more spaces between the mid-block crosswalk and Broadway to the north.

There are eight off-street public parking facilities located in the construction project area (The Embarcadero, Drumm, Spear and Howard Streets), providing about 2,100 spaces, with an overall parking occupancy rate at midday of about 81 percent (Adavant Consulting, 2012). In addition, three private garages and three loading docks also have direct access to Drumm, Spear or Howard Streets.

Regulations

All work involving excavations in San Francisco street areas is regulated by the SFDPW under Public Works Code Article 2.4. The City coordinates all street activities through the SFMTA's TASC involving representatives from the SFDPW, the SFMTA, and Fire, Police, and Public Health. Construction work must abide by SFDPW's the Regulations for Working in San Francisco Streets (the "Blue Book") and be coordinated through the *Street Construction Coordination Center* of SFDPW and the TASC. As part of the City's process, SFPUC is required to develop in conjunction with SFDPW and SFMTA and incorporate into its contract specifications a detailed Traffic Control Plan.

Approach to Analysis and Significance Criteria

Once constructed, the proposed project would require periodic operations review and maintenance, similar to existing conditions, and would not generate new vehicle trips, but could require closure of one or more southbound traffic lanes in The Embarcadero for up to one day, once per year to access the vaults as part of the new maintenance. Therefore, this analysis focuses on construction-related impacts of the project, which include temporary lane closures and generation of vehicle traffic (construction workers' vehicles, equipment, and trucks) traveling to and from the work sites on area streets. Standard transportation engineering methodologies are used in conducting the transportation impacts analysis. Although construction-related transportation impacts are not typically considered significant because of

their limited duration, the analysis looks at potential short-term effects of construction, including those on traffic operations (including transit), pedestrian/bicycle facilities, commercial and passenger loading facilities, emergency access, and temporary effects to parking (for informational purposes only). The construction-related information used for the analysis is based on current project specifications, the latest discussions with SFMTA about those specifications, and similar construction projects throughout the city.

Significance criteria (including thresholds of significance) commonly used by the San Francisco Planning Department to assess whether a proposed project would result in significant impacts to the transportation network are geared toward impacts during project operations (i.e., on-going, long-term, impacts), not temporary, short-term, impacts associated with project construction such as what would occur during the project. As such, a quantitative assessment of traffic level of service, and travel demand related to public transit, pedestrians and bicyclists is not used for the analysis.

Impact TR-1: Closure of travel lanes during project construction would temporarily reduce roadway capacity and increase traffic delays on area roadways, causing temporary and intermittent conflicts with all modes of travel, but the effects would be of short duration and limited in magnitude. (Less than Significant)

As described above, the City coordinates all street activities through the TASC, involving representatives from the SFPD, the SFMTA, and Fire, Police, and Public Health. As part of the City's process, SFPUC, working with SFPD and SFMTA, has developed procedures for managing street closures during the construction. Under these procedures, SFPUC would maintain traffic flow on The Embarcadero, although sometimes on a reduced number of travel lanes (discussed below), and would maintain local access for residents and businesses along the force main and water main alignments (Drumm Street from Jackson Street to Market Street, Spear Street from Market Street to Howard Street, and Howard Street from Spear Street to Steuart Street) throughout construction of the project by providing a minimum of one 11-foot-wide access lane on all streets. In the following cases, less than one full lane would be provided, but local access for residents and businesses would be maintained:

- Northbound Drumm Street (between California and Sacramento Streets) would be closed to general traffic on Saturdays and Sundays during two weekends for force main installation, from 9:00 a.m. to 8:00 p.m.; a northbound lane would be provided during these times for valet vehicles and taxi cabs only to access the porte cochere at the Hyatt Regency Hotel to load and unload passengers and for emergency vehicles.
- Northbound Drumm Street (between Sacramento and Washington Streets) would be closed to general through traffic on weekdays during force main installation, from 9:00 a.m. to 4:00 p.m.; access for emergency vehicles would be maintained at all times, by providing a southbound 12-foot-wide lane. Access across Drumm Street on Clay Street east of Drumm Street would be

maintained on no less than a single reversible traffic lane during force main installation on that segment of Drumm Street.

- Clay Street (east of Drumm Street), which dead-ends at the entry/exit access for the parking garage in Four Embarcadero Center, would have a single reversible traffic lane on weekdays during water main replacement, from 9:00 a.m. to 4:00 p.m.
- Jackson Street (west of Drumm Street) would have a single reversible traffic lane on weekdays during water main replacement, from 9:00 a.m. to 4:00 p.m.

In general, construction at any given time along the Drumm, Spear and Howard Streets alignment (and associated travel lane restrictions) would occur on up to three city blocks and at two intersections at a time, approximately four to six weeks per block, keeping one lane of traffic available at all times. During construction, motorists could choose to divert to other streets, bypassing the construction zone. Construction work would have to abide by the Regulations for Working in San Francisco Streets (the “Blue Book”), including holiday season restrictions from the day after Thanksgiving through January 1st for blocks that meet the Holiday Moratorium restrictions.⁹

Upon completion of force main installation and water main relocation/replacement in each block, SFPUC would restore the traffic lanes. When northbound Drumm Street is closed to through traffic between California and Sacramento Streets on two weekends from 9:00 a.m. to 8:00 p.m., traffic would be forced to detour via California and Front Streets. Due to the relatively lower weekend volumes on those streets, the construction-related traffic increases along these streets would not be expected to exceed existing typical weekday traffic conditions. Therefore, construction-related increases in traffic would be temporary and small in relation to the existing traffic volumes.

The intersection of Spear Street/Mission Street operates at LOS D, but because the planned lane reduction would primarily occur on the lower-volume Spear Street, and trenchless construction would occur under Mission Street, the level of service at this intersection would not be expected to deteriorate substantially.

As described above, local access would be maintained for residents and businesses during the water main replacement work on Drumm Street by providing a minimum of one 11-foot-wide access lane on all streets from 9:00 am to 4:00 pm; all lanes would be available outside of these hours. The effect on traffic

⁹ The SFDPU halts road construction work on busy commercial corridors between Thanksgiving Day and New Years to minimize traffic congestion and effects on businesses and shoppers during the peak shopping season. Streets with 50 percent or more commercial use, determined at the time of construction, are subject to this moratorium. Work may be allowed between the hours of 10:00 p.m. and 7:00 a.m. as long as the proper night noise permit is obtained.

flow and circulation would not be substantial because the reductions in road capacity would be localized and temporary.

Construction of Vault Nos. 1 and 2 partially within The Embarcadero would require temporary lane closures as follows:

- Southbound The Embarcadero (north of Washington Street) would have a single traffic lane for five weeks during initial construction of Vault No. 1 and installation of the road decking built to facilitate traffic flow on The Embarcadero while construction of the vault is taking place, and for up to one week while the decking is removed and pavement restored.
- Once the road decking is in place, two traffic lanes would be provided (weekdays and weekends) on southbound The Embarcadero, north of Washington Street, during the remaining two months for construction of Vault No. 1, except from 9:00 p.m. to 6:00 a.m. Sunday through Thursday and from 12 midnight to 8:00 a.m. Friday and Saturday, when a single southbound lane would be provided. The peak-period lane would be closed at all times during this construction period.
- Two traffic lanes would be provided at all on southbound The Embarcadero, north of Washington Street, during construction of Vault No. 2 (approximately two months); the peak-period lane would be closed at all times during this construction period.
- During construction of both Vault Nos. 1 and 2, the southbound bicycle lane would be eliminated and bicycles would share the traffic lane with motor vehicles for approximately 200 feet through the construction area or alternatively could use alternate routes such as southbound Battery Street to the west. The sidewalk would be closed next to the construction site, and pedestrians could use the Drumm Street Promenade or The Embarcadero Promenade (Herb Caen Way) (via the crosswalk at Washington Street and the mid-block crosswalk between Broadway and Washington Streets).

The Embarcadero carries more than 1,400 southbound vehicles per hour during the evening peak commute period (4:00 to 6:00 p.m.). Planned reductions in the number of travel lanes from the existing three to one along southbound The Embarcadero during the peak commute periods (6:00 to 9:00 a.m. and 3:00 to 6:00 p.m.) for the five weeks of Vault No. 1 road decking installation and removal would cause operations along southbound The Embarcadero to temporarily deteriorate. The intersection of The Embarcadero/Washington Street currently operates at LOS C during the weekday PM peak hour. Planned reductions in the number of lanes along southbound The Embarcadero during the peak commute periods would likely cause operations at this intersection to deteriorate to LOS F for this five-week period. The remainder of Vault No. 1 construction would permit two travel lanes during all times. Therefore, the effects to traffic on The Embarcadero would be greatest during the five-week Vault No. 1 decking construction period.

However, to minimize traffic disruptions during construction, the SFPUC would place Changeable Message Signs (CMS) signs at locations throughout the City to warn drivers of the work on The Embarcadero during the entire three-month construction period. Additional measures that could be implemented and under discussion with SFMTA include re-timing of the traffic signal at the intersection of The Embarcadero/Washington Street to favor the southbound movement.

In addition, the SFMTA is considering a recommended detour for southbound vehicles on The Embarcadero that would re-route some traffic towards Battery Street, which would then turn left (eastbound) at Washington Street to reach The Embarcadero. This plan would require the conversion of Washington Street from one-way westbound to two-way operation between Battery and Drumm Streets. Alternatively, traffic on Battery Street could instead turn left (eastbound) at Clay Street, then turn right (southbound) at Davis Street to reach Market Street, and continue southbound on Beale Street where vehicles could return to The Embarcadero or to other destinations in the south of Market area. Either plan would require proper signage and adjustments to the operations of the traffic signals.

As described above, as part of the City's process, SFPUC would implement a Traffic Control Plan, and coordinate with the appropriate jurisdictional agencies through the *Street Construction Coordination Center* of SFPDW and the City's TASC. The Traffic Control Plan would, at a minimum, include the following elements:

- Circulation and detour routes would be developed to minimize impacts on local street circulation. For example, lane closures on northbound Drumm Street between California and Sacramento Street would be conducted on weekends only, and most other lane closures would generally avoid the AM and PM peak commute periods. Roadside construction safety protocols would be implemented.
- Truck trips would be scheduled during hours of the day other than the peak morning and evening commute periods to the extent feasible.
- Flaggers, uniformed off-duty San Francisco Police officers, and Muni inspectors would be stationed at various locations as determined by the City Traffic Engineer to facilitate the movement of pedestrians, bicyclists and transit vehicles.
- Pedestrian and bicycle access and circulation would be maintained during project construction where safe to do so. The contractor would be required to maintain bicycle lanes/lane widths to accommodate bicycle traffic or seek a permit from SFMTA to address bicycle route detours and signage for any lane closures. Where construction activities encroach on bicycle lanes such as southbound The Embarcadero, warning signs would be posted to warn bicyclists and drivers of upcoming traffic hazards. Detours will be included for bicyclists and pedestrians in all areas potentially affected by project construction.

- Written notification will be provided to all emergency service providers (fire, police, and ambulance) prior to road closure, and emergency service vehicles will be given priority for access.
- Construction would be coordinated with facility owners or administrators of key facilities such as private and public garages, loading dock locations, and the porte cochere at the Hyatt Regency Hotel. Facility owners or operators will be notified in advance of the timing, location, and duration of construction activities and the location of detours and lane closures.
- The SFPUC and the contractor would coordinate with affected property owners to ensure that, during the proposed lane closure periods, trucks have sufficient room to maneuver in and out of the loading docks, without encroaching into the construction zone.
- A public information plan would be developed to provide adjacent residents and businesses with regularly-updated information regarding project construction in their area, including construction activities, durations, peak construction vehicle activities (e.g., excavation), travel lane closures, and other lane closures. This information would also be presented in the SFPUC web site and would be updated regularly, as construction conditions change.
- The contractor would be encouraged to reduce the number of vehicle trips by construction workers by facilitating the use of public transportation and minimizing construction work parking supply.
- SFPUC would coordinate with the SFMTA to determine potential temporary rerouting for bus lines in the project area related to traffic and parking lane closures. Bus stops in the area that could be affected by construction activity, such as those on Spear and Drumm Streets, could be relocated and temporary bus stops installed based on SFMTA review and approval.

Implementation of the project's Traffic Control Plan during construction would serve to decrease vehicle trips on southbound The Embarcadero and would help to reduce congestion in the vicinity of the construction area.

Therefore, due to the short duration and limited magnitude of traffic disruptions and the implementation, as part of the project, of measures to address localized construction effects, such as a project-specific Traffic Control Plan, construction-related impacts related to a temporary reduction in roadway capacity and increased traffic delays would be *less than significant*.

Impact TR-2: Project construction would cause temporary increases in traffic volumes on area roadways, but would not cause conflicts with the performance of the circulation system. (Less than Significant)

Table 2 in the Section B, Project Description summarizes the expected construction travel demand by major task. The entire project would generate up to about 4,480 one-way truck trips over a 14-month period (about 295 working days excluding weekends and holidays), resulting in an average of

approximately 16 one-way truck trips per day, or about two or three one-way truck trips per hour. The maximum number of daily construction trips expected by the SFPUC is 50 one-way truck trips, and about 7 or 8 one-way truck trips per hour, which would occur for up to two months during the peak construction period.

In addition, construction would require an estimated 15 workers per day for open trench construction; and ten workers per day for trenchless construction. The trip distribution and mode split of these workers is not available, but assuming that about 30 percent of workers would drive to the construction site (similar to other workers destined to downtown San Francisco), there would be nine daily vehicle work trips (4 or 5 one-way trips each morning and afternoon) associated with open trench related construction, and six daily vehicle work trips (3 one-way trips each morning and afternoon) associated with trenchless construction.

During construction, the project would generate traffic associated with workers, haul trucks and delivery trucks, involving up to 15 workers and 25 trucks per day. Using the above assumptions, the highest total project-generated vehicular trips during both the a.m. and p.m. peak hours would be approximately 12 one-way vehicle trips per hour (4 or 5 open-trench worker trips plus 7 or 8 truck trips).

While the exact routes that construction trucks would use would depend on the location of the available disposal sites, it is expected that The Embarcadero, Washington Street, Mission Street, Howard Street, Harrison Street, and King Street would be the primary haul and access routes to and from I-80 and I-280. The effect of 7 or 8 additional construction truck trips per hour on those streets would be a minor lessening of their traffic-carrying capacities due to the slower movement and larger turning radii of trucks, which may affect traffic and transit operations. However, due to its temporary nature and limited magnitude, the effect of this construction-related increase in traffic and truck volume on traffic and transit operations would not be expected to be substantial. Further, a measure would be included in the construction Traffic Control Plan to limit truck trips and deliveries during the peak commute periods. Therefore, the impact would be *less than significant*.

Impact TR-3: The proposed project would not be located within an airport land use plan, within two miles of a public airport, or in the vicinity of a private air strip. (Not Applicable)

The nearest airports to the project area are San Francisco International Airport approximately 11 miles to the south and Oakland International Airport approximately 11 miles to the southeast. Therefore, impacts

related to location within an airport land use plan, within two miles of a public airport, and in the vicinity of a private air strip are *not applicable*.

Impact TR-4: The proposed project would not substantially increase hazards due to a design feature or incompatible uses. (No Impact)

The proposed project would not change the roadway network or introduce any new land uses to the project vicinity. Therefore, there would be *no impact* related to increased hazards due to a design feature or incompatible uses.

Impact TR-5: Project construction would not substantially limit access to adjacent roadways and land uses due to construction within roadways. (Less than Significant)

Loading and Access Impacts

In order to provide one travel lane each way at most times during construction, on-street yellow-curb and white-curb designated parking spaces and zones may be temporarily eliminated in some blocks within the immediate construction area, affecting commercial and passenger loading/unloading operations. To the extent that loading demand could not be accommodated within existing on-street loading zones, double-parking, illegal use of sidewalks and other public space may occur on the adjacent streets, with associated disruptions and impacts to traffic and transit operations as well as to bicyclists and pedestrians; these potential negative effects can be minimized with increased enforcement of traffic laws during construction. The loss of on-street commercial and passenger loading spaces on each block would occur during the estimated six to eight weeks that construction takes place at a particular location, with the number of spaces affected being a portion of the on-street parking being temporarily removed on one or both sides of the street.

The closure of northbound Drumm Street, between California and Sacramento Streets to general traffic on Saturdays and Sundays during sewer pipeline work would necessitate relocation of the existing taxi stand located in front of the Hyatt Regency Hotel (with capacity for eight to 10 vehicles) to a temporary taxi stand with similar capacity on the south curb of California Street, just west of Drumm Street. Taxi access to the Hyatt Regency Hotel would be maintained via a temporary travel lane on northbound Drumm Street, between California and Sacramento Streets.

The SFPUC would notify garage owners and operators in advance of the timing, location, and duration of construction activities in front of their facilities. Access to garage parking, loading docks, and trash

collection driveways along the construction alignment would be maintained at all times, with flaggers being deployed as necessary. The SFPUC and the contractor would coordinate with the property owners to ensure that during the proposed lane closure periods, trucks would have sufficient room to maneuver in and out of the loading docks, without encroaching into the construction zone. Alternatively, SFPUC and the contractor would coordinate with property owners and trash collection companies regarding the possibility of providing service, deliveries and pickups outside the construction and lane closure periods, which are typically weekdays from 7:00 a.m. to 4:00 p.m.

The above procedures, which will be part of the Traffic Control Plan and incorporated into contract specifications for the project, will minimize the effect of the disruptions to the availability of commercial parking and passenger loading, and potential hazards to commercial and passenger loading and unloading activity. Given these procedures and the temporary nature of any disruptions, the project effect would be considered a *less than significant* impact.

Emergency Access

Similar to traffic-related impacts, the proposed lane closures along The Embarcadero, and Drumm, Steuart and Howard Streets during construction could slow, but would not prevent, emergency vehicle traffic access in the immediate area of construction. Further, the project's Traffic Control Plan would give emergency vehicles (police, fire, and ambulance) access priority during the lane closure period, including during the force main construction weekend lane closures of northbound Drumm Street (California to Sacramento Streets), a two-weekend construction period. Similar to existing conditions, emergency vehicles traveling southbound on The Embarcadero would be able to use the streetcar exclusive right-of-way located in the median. In addition, the project's Traffic Control Plan would include a requirement for written notification to all emergency service providers prior to road closures, and detour signs and flaggers would be in place during the lane closure periods. The project effects on emergency access would thus be *less than significant*.

Impact TR-6: Project construction would not substantially impair access to alternative transportation facilities (public transit, bicycle, or pedestrian facilities), although it could temporarily decrease the performance of such facilities. (Less than Significant)

Transit Impacts

The proposed project would not create additional demand for local or regional transit lines, but construction could cause temporary impacts to operations of local Muni routes and one Amtrak bus

route through the project area. There are three bus stops in the area that would be directly affected by construction activity: one at the northeast corner of Drumm and California Streets (serving the 41 Union, 80X Gateway Express, 82X Levi Plaza Express, and Amtrak bus service), one at the southwest corner of Spear and Market Streets (serving the 2 Clement, 6 Parnassus, 9/9L San Bruno, 21 Hayes and 31 Balboa), and one at the northeast corner of Howard and Spear Streets (serving the 30X Marina Express).

Muni operations at the bus stop on Drumm Street between California and Sacramento Streets would not be adversely affected because work on this block would occur on weekends only; the Muni bus lines that use this stop do not operate on weekends. The effects on the Muni stop at the northeast corner of Howard and Spear Streets would be limited to the duration of construction in the area, approximately five to six weeks for one block.

The SFPUC has consulted with SFMTA regarding the temporary relocation of specific bus routes and bus stops affected by the project. The current plan envisions that during construction on Spear Street, between Market and Mission Streets (approximately 16 weeks for both the water main and force main installation), Market Street eastbound bus routes 2 Clement, 6 Parnassus, 9/9L San Bruno, 21 Hayes and 31 Balboa would be directed to pass Spear Street, turn right onto Steuart Street, and then loop back via Mission Street. On Saturdays and Sundays during force main installation (approximately four weekends), when northbound Drumm Street would be closed to general traffic from 9:00 a.m. to 8:00 p.m.; the northbound 41 Union trolley bus line, and the 80X Gateway Express and 82X Levi Plaza Express motor coach lines would not be adversely affected because they operate only on weekdays.

These tentative re-routings, which would be coordinated with SFMTA, would require the temporary elimination of the bus stop at the southwest corner of Spear and Market Streets; a temporary stop would be established by SFMTA when construction begins.

The F-Market & Wharves streetcar line, which operates on an exclusive right-of-way along the northeast waterfront, would be unaffected by the construction work on The Embarcadero. Because Market and Mission Streets would remain open to through traffic during construction activities, the F Market & Wharves, 14 Mission, 14L Mission Limited, and 14X Mission Express bus lines would not be expected to be substantially delayed during construction. California Street cable car service would not be disrupted, but the area available for riders to wait on the north side of the tracks would be eliminated during construction of the new force main under the Market Street pedestrian plaza (approximately eight weeks); passengers instead would wait on the south side only. A Muni inspector would be deployed

during construction to assist cable car passengers to access the vehicles from the south side of the tracks. With or without these changes, any disruptions to local bus service along project streets would be temporary in nature, affecting only the immediate area surrounding the construction zone for eight weeks.

One of the Embarcadero BART/Muni Metro station entrances is located at the Market Street pedestrian plaza, on the north side of Market Street. A clear pathway of minimum eight feet wide between construction barricades would be provided for pedestrian movements between Drumm and Market Streets, and the BART/Muni Metro entrance. The entrance at the southwest corner of Market and Spear Streets would therefore not be affected by project construction. No BART or Muni Metro service impacts would be expected during project construction.

Amtrak bus route 99 to/from the Emeryville rail station at the bus stop on Drumm Street between California and Sacramento Streets would be affected because the service operates on weekends when construction takes place in this location. The SFPUC would consult with Amtrak regarding the temporary relocation or elimination of this bus stop during the two weekends when northbound Drumm Street between California and Sacramento Streets would be closed to general traffic. An alternate bus stop could be implemented nearby. For example, the north side of California Street, immediately west of Drumm Street could be used. This alternative stop would occupy two or three existing loading (yellow) spaces. Alternatively, the bus stop could be eliminated and riders could be directed to the closest Amtrak stop, located at the Ferry Building approximately 1,200 feet away, which is the end of the line.

Further, as part of the project's Traffic Control Plan, SFPUC would continue to coordinate with SFMTA to determine the appropriateness of potential rerouting for bus lines and the temporary relocation of bus stops in the project area. In addition, the project construction would include a public information plan through its public relations office to provide adjacent residents and businesses with regularly-updated information regarding project construction in their area.

For the reasons described above, impacts related to disruptions in transit service would be *less than significant*.

Pedestrian and Bicycle Impacts

The project is located in the financial district and south of Market areas of San Francisco, and in proximity to several key transit facilities the Embarcadero BART/Muni Metro Station, the Temporary

Transbay Terminal, and the Ferry Terminal. As a result, there is generally a high level of pedestrian activity throughout the day, with peaks occurring in the morning as employees head to work, during midday as employees head to and from lunch, and in the evening as employees head home. The SFPUC would generally maintain pedestrian crossings at intersections during construction through the use of trenchless technology, generally providing a minimum width of five feet of clear sidewalk for pedestrians at all times. At several affected intersections (e.g., at the intersections of Drumm and Washington Streets, Spear and Mission Streets, and Spear and Howard Streets), three of the four crosswalks would be maintained and the fourth would be relocated. The SFPUC would provide an obstruction-free pathway of eight feet minimum width protected with construction barricades at the Market Street/Drumm Street Plaza to facilitate pedestrian movements between Drumm Street, Market Street, the Hyatt Regency Hotel and the BART/Muni Metro entrance. The adjacent sidewalk would be closed during the five-week period required for construction of the road decking, a one-week period required for removal and pavement restoration, and an additional two months during construction of Vault No. 1. Construction of Vault No. 2 would also close the sidewalk for two months. This activity would affect approximately 194 pedestrians during the weekday PM peak hour. The pedestrians could use the Drumm Street Promenade or The Embarcadero Promenade (via the Washington Street crosswalk and the mid-block crosswalk between Broadway and Washington Street).

Project-generated traffic (truck trips and worker trips) to and from the project area is estimated at 12 one-way vehicle trips per hour during each of the AM and PM peak periods including 4 or 5 workers and 7 or 8 one-way truck trips per hour during midday. To protect the safety of pedestrians where this traffic crosses pedestrian crossings, the SFPUC would provide construction safety measures such as a flagger. Additionally, the project's Traffic Control Plan would include traffic hazard signage, including specific warning signs related to pedestrian and bicycle traffic, and a public outreach campaign.

With provision of pedestrian pathways and construction safety measures implemented as part of the project, impacts on pedestrian circulation and safety would be *less than significant*.

The contractor would be required to maintain bicycle lanes/lane widths to accommodate bike traffic during construction or seek a permit from SFMTA to address bicycle detours and signage for any lane closures. The primary bike route affected through the construction of the project would be Bike Route No. 5, specifically the southbound bike lane along The Embarcadero. The Class II southbound bicycle lane on the west side of The Embarcadero would be temporarily closed during the three-month construction of Vault No. 1, affecting approximately 44 bicyclists during the weekday PM peak hour.

Bicyclists would be required to temporarily merge with southbound motor vehicle traffic for approximately 200 feet through the construction area or, alternatively, could use alternate routes, such as southbound Battery Street to the west.

The Class III bicycle facility (signed route only where bicycles and motor vehicles share the traffic lane) on westbound (north side of) Howard Street (Route No. 30) between Steuart and Spear Streets would be minimally affected because project construction would take place on the south side of the street (eastbound direction). Similarly, project construction and truck traffic in the vicinity of Market Street could intermittently affect bicycle operations on Route No. 50. In general, project activities such as lane closures, construction traffic and traffic detours would increase the potential for motor vehicle/bicycle conflicts, but would not be expected to create hazardous conditions or substantially interfere with bicycle accessibility through the project area. Due to the temporary and transitory nature of the construction area, construction-related project impacts on bicycle traffic and facilities would be *less than significant*.

Parking Discussion

San Francisco does not consider parking supply as part of the permanent physical environment and therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel.

Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's "Transit First" policy. Accordingly, the following parking conditions are presented for informational purposes only.

The proposed project would not produce any additional parking demand once completed. During construction, the proposed project would require approximately 15 construction workers per day for open-trench construction and 10 construction workers per day for trenchless construction. Temporary parking demand from construction workers' vehicles would occur in proportion to the number of construction workers commuting by automobile, assumed to be about 30 percent (similar to other workers destined to downtown San Francisco), or three to five parking spaces per day. If parking were not available in the project staging areas identified in Section B, Project Description, workers could park in any existing off-street parking facilities in the project vicinity, where paid parking is currently available.

On-street parking capacity along the immediate force main alignment would be temporarily reduced, affecting automobile and motorcycle parking, and area residents, merchants, employees and customers may have to find alternate parking spaces in the surrounding area. Generally, loss of on-street parking on each block would occur during the four to six weeks that construction takes place on that block. Approximately eight off-peak metered on-street parking spaces on the west side of The Embarcadero would not be available during the three-month construction period for Vault No. 1 and the two-month construction period for Vault No. 2 because the construction zone's northern limit would extend to the midblock crosswalk. In addition, approximately half of the 14 existing on-street parking spaces on the west side of The Embarcadero between Broadway and the mid-block cross walk would likely be eliminated as part of traffic channelization during these periods. Due to the temporary elimination of on-street parking spaces to accommodate construction activities along Drumm, Spear and Howard Streets, area residents, merchants, employees and customers may have to find alternate parking spaces in the surrounding area.

Impact C-TR: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not substantially contribute to cumulative traffic increases on local and regional roads. (Less than Significant)

Cumulative Construction Impacts

Traffic impacts that could result from the proposed project are limited to the immediate vicinity of the project area and to the construction phase. Therefore, the geographic scope of potential cumulative impacts on transportation and circulation is limited to the project area and immediate vicinity. Further, the project would not contribute to cumulative long-term traffic impacts because the project-related impacts are restricted to the construction period.

Of the projects listed in Table 3, three could be under construction at the same time as the North Shore to Channel Force Main Project: the 8 Washington Street/Seawall Lot 351 mixed-use development (residential and retail), 34th America's Cup, and the James R. Herman Cruise Terminal and Northeast Wharf Plaza at Piers 27-29. Although not approved at the date of this analysis, construction of the 8 Washington Street/Seawall Lot 351 project, is planned to take about 27 to 29 months, and could begin in late 2012. The first phases of construction for this project would take about 17 months and would include demolition (one month), excavation and shoring (nine months), and foundation and below-grade construction work (seven months). The final phases of construction, including construction of the parking garage, and construction of the buildings, would take an additional 10 to 12 months (CCSF, 2011b). Thus, it is likely that the construction of the North Shore to Channel Force Main project would overlap with some portion of the construction activities for the 8 Washington Street/Seawall Lot 351 project. The 8 Washington Street/Seawall Lot 351 project is expected to generate 200 one-way daily truck trips during construction, or about 25 to 31 one-way truck trips per hour. Trucks could be expected to use Washington Street to enter/exit the construction site to/from I-280 and I-80 via The Embarcadero, and would not use streets where construction of the proposed project would occur. Therefore this traffic would not be affected by construction of the proposed project (CCSF, 2011b).

Construction of the James R. Herman Cruise Terminal and Northeast Wharf Plaza project at Piers 27-29 would be carried out in two phases. Phase 1 would be coordinated with the development of the proposed America's Cup Village (AC Village) at Piers 27-29. Phase 1 includes demolition of the Pier 27 shed in its entirety, along with a portion of the Pier 29 shed, to create an area for a proposed expansive temporary public viewing platform. Demolition began in February 2012, and the Port is expected to complete Phase 1 construction of the cruise terminal core building and shell in spring 2013 for the AC Village activities during the events in July-September 2013 (CCSF, 2011a). After the conclusion of the 34th America's Cup match in fall 2013, and removal of all temporary facilities at Piers 27-29 in late 2013, construction of Phase 2 of the cruise terminal would be initiated. Phase 2 would include completion of certain interior spaces required for cruise terminal operations and installation of the maritime equipment. Construction of the cruise terminal is expected to be completed and the terminal begin operations in 2014 (CCSF, 2011a). Thus, the North Shore to Channel Force Main project would only overlap with Phase 1 of construction of the cruise terminal.

Construction activities for the America's Cup are scheduled to begin in March 2012, primarily at Piers 30-32 and other waterfront locations. Many of the construction activities would be completed by the time of the America's Cup events in August 2012. Other construction activities, such as Phase 1

construction of the cruise terminal described above, would be complete by the America's Cup events in July 2013.

Although closure of some southbound lanes on The Embarcadero during construction of the North Shore to Channel Force Main project would partially coincide with Phase 1 construction of the cruise terminal, the Cruise Terminal project would not involve any excavation, thus minimizing the number of construction truck trips on The Embarcadero from Piers 27-29 (CCSF, 2011a).

Although all four projects could overlap in their construction in the same general vicinity, cumulative impacts related to transportation and circulation would be considered *less than significant*. Additionally, the project would implement a Traffic Control Plan requiring coordination with the appropriate jurisdictional agencies through SFPDW and the TASC.

Near-term Future Cumulative Impacts

The 34th America's Cup World Series Events and Youth America's Cup Series would take place in San Francisco in 2012, from August 11 through September 2, 2012. The North Shore to Channel Force Main project would not conflict with these events because as part of an agreement between the SFPUC and the Mayor's Office, the North Shore to Channel Force Main Project construction activities would not take place along The Embarcadero during the 2012 events and all three southbound lanes, the sidewalk, and the bicycle lane would be open at normal capacity (SFPUC, 2012).

The Louis Vuitton Cup and America's Cup Challenger Series would take place from July through September, 2013. Similarly, the North Shore to Channel Force Main Project would not conflict with these events because no construction activities would be underway during the America's Cup events. The SFPUC intends to complete all construction work for the proposed project before the America's Cup events in 2013. However, if this is not possible, the SFPUC would ensure that all roadways, transit service, and bicycle and pedestrian access would be restored prior to July 1, 2013. In addition, The Embarcadero would be restored to permanent pavement with full pedestrian, bicycle and roadway access prior to the 2013 events.

For the reasons specified above, no cumulative transportation impact is anticipated during the America's Cup events in 2012 and 2013.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
6. NOISE—Would the project:					
a) Result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Be substantially affected by existing noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Noise Descriptors

The manner in which sound travels through a medium (such as air or water) is influenced by the physical properties of the medium (such as its temperature, density, and humidity). The amount of energy in the sound is proportional to the pressure it generates in the medium. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel (dB) scale is used to quantify sound intensity. Because sound can vary in intensity by more than 1 million times within the range of human hearing, a logarithmic scale is used to keep sound pressure measurements within a convenient and manageable range. Because the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions in a process called “A-weighting,” expressed as “dBA.” The A-weighted decibel, dBA, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. A 10-dBA increase in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented in this section are expressed in terms of dBA unless otherwise indicated. **Table 5** shows some representative noise sources and their corresponding noise levels in dBA.

TABLE 5
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT

Examples of Common, Easily Recognized Sounds	Decibels (dBA)	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85 ^a	
School Cafeteria with Untreated Surfaces	80	Loud
Lawnmower	70 ^b	
Near Freeway Auto Traffic	60 ^b	Moderate
Average Office	50 ^b	
Soft Radio Music in Apartment	40	Faint
Average Residence without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

^a Continuous exposure above 85 dBA is likely to degrade the hearing of most people.

^b Range of speech is 50 to 70 dBA.

SOURCE: U.S. Department of Housing and Urban Development, 1985.

Planning for acceptable noise exposure must take into account the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines (U.S. EPA, 1974) are as follows: noise levels above 35 dBA can disturb sleep; noise levels of 60 dBA begin to interfere with human speech; and prolonged exposure to noise levels greater than 85 dBA can damage hearing.

Variations in noise exposure over time are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement, or alternatively as a statistical description of what sound level is exceeded over some fraction (10, 50 or 90 percent) of a given observation period (i.e., L10, L50, L90).¹⁰ Leq (24) is the steady-state acoustical energy level measured over a 24-hour period. Because community receptors are more sensitive to unwanted noise intrusion during

¹⁰ L10 is the noise level that is equaled or exceeded 10 percent of the specified time period. L50 is the noise level that is equaled or exceeded 50 percent of the specified time period and represents the median sound level. L90 is the noise level that is equaled or exceeded 90 percent of the specified time period, and is sometimes used to represent the background sound level.

the evening and at night, state law requires that, for planning purposes, an artificial dBA increment be added to “quiet time” noise levels to form a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL). CNEL adds a 5-dBA “penalty” during the evening hours (7 p.m. to 10 p.m.) and a 10-dBA penalty during the night hours (10 p.m. to 7 a.m.). Another 24-hour noise descriptor, called the day-night noise level (Ldn), is similar to CNEL. Both CNEL and Ldn add a 10-dBA penalty to all nighttime noise events between 10 p.m. and 7 a.m., but Ldn does not add the evening 5-dBA penalty. In practice, Ldn and CNEL usually differ by less than 1 dBA at any given location for transportation noise sources. Lmax is the maximum, instantaneous noise level registered during a measurement period.

Vibration Descriptors

Vibrations caused by construction activities can be interpreted as energy transmitted in waves through the ground. These energy waves generally dissipate with distance from the vibration source (e.g., pile driving or sheetpile driving). Because energy is lost during the transfer of energy from one particle to another, vibration becomes less perceptible as distance from the source increases. Vibration attenuates as a function of the distance between the source and receptor. Vibration emanating from a single location (a “point source”) attenuates at a rate of approximately 50 percent for each doubling of distance from the source (termed the “inverse square law”). This calculation tends to underestimate attenuation, and therefore provides a “worst-case” estimate of vibration at the receptor.

Vibration is an oscillatory motion that can be described in terms of displacement, velocity, or acceleration. Peak particle velocity (PPV) is defined as the maximum instantaneous positive or negative peak of the vibration signal. PPV is used to assess the potential for damage to buildings and structures and is expressed in in/sec.

Vibration can affect both humans and structures and the responses of each to vibration are influenced by a combination of factors, including soil/rock type, distance from the source, duration, and the number of perceived vibration events. Energy transmitted through the ground as vibration can reach levels that cause structural damage; however, humans can perceive vibration amplitudes at levels well below the levels that cause architectural or structural damage. Some reference values for vibration are: a freight train passing at a distance of 100 feet can result in vibrations of 0.1 in/sec PPV; a strong earthquake can produce vibrations in the range of 10 in/sec PPV.

In general, threshold damage¹¹ to buildings can occur at vibrations greater than 0.5 in/sec PPV, which is consistent with the threshold cracking criteria of 0.5 in/sec PPV for low frequencies¹² (AASHTO, 2004). A much higher threshold of 4.0 in/sec PPV is applied to buried facilities such as pipelines.¹³ Much lower vibration levels (i.e., those exceeding 0.016 in/sec PPV) can cause disturbance or annoyance to persons; this threshold is typically applied to construction activities during the more sensitive nighttime hours (Dowding, 1966). Exceedance of the annoyance threshold at night could result in sleep disturbance, depending on the receptors' proximity to construction activities.

Existing Noise Environment

The proposed project is located in an urban area where the sound of vehicular traffic (autos, trucks, buses) on local streets dominates the existing ambient noise environment. The Bay Bridge/I-80 freeway is approximately 1,500 feet southeast of the southernmost project alignment. BART and Muni trains operate underground below Market Street and traverse the project alignment but because of their underground location, they do not generate substantial noise at street level. The California Street cable car line is located on Market Street and terminates immediately adjacent to the project alignment in the Market Street Pedestrian Plaza. The Muni F-line historic street car line travels up Market Street, past the project alignment and along the Embarcadero, passing the two proposed vault locations on The Embarcadero.

Residential and hotel uses are the most noise-sensitive uses in the project area. Therefore, measurements to characterize the existing noise environment for the proposed project were collected at the closest sensitive receptors adjacent to the new force main alignment:

Measurement Location No. 1: the Gateway (high-rise apartment complex) on Drumm Street between Jackson and Washington Streets

Measurement Location No. 2: Hyatt Regency Hotel at California and Drumm Streets

¹¹ For the purpose of this analysis, threshold damage is defined as the level of vibration above which cosmetic damage to structures could occur. This criterion provides a conservative approach to assessing the potential for structural damage, which would occur at higher vibration levels than the threshold for cosmetic damage. As noted under Impact NO-2, the construction contractor would maintain responsibility for repairing any damage to adjacent structures.

¹² The Federal Transit Administration (FTA) recommends a vibration threshold of 0.2 in/sec for fragile buildings (FTA, 2006); however, because this threshold is recommended for non-engineered timber and masonry buildings, this threshold for fragile buildings is not warranted for this project because structures along the force main alignment have been engineered to current building standards.

¹³ Vibration under the ground surface is lower than that measured at the ground surface. A threshold of 4.0 in/sec PPV is commonly used for underground optical-fiber cables. Underground or restrained concrete structures can withstand vibration of 10.0 in/sec PPV before threshold cracks appear. Thus, underground utilities are less sensitive than surface structures (WIA, 2009). The 4.0 in/sec PPV threshold is consistent with thresholds recommended by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

Figure 9 shows the measurement locations, and **Table 6** presents the measurement results. **Figures 10** and **11** show the measurement results in graphic form. To the south, additional residential uses are on Floors 7 to 20 of the Rincon Center at Spear and Howard Streets, but these residential receptors are located farther from the project alignment than those at the Gateway (a minimum of approximately 100 feet from the project alignment because of their higher location).

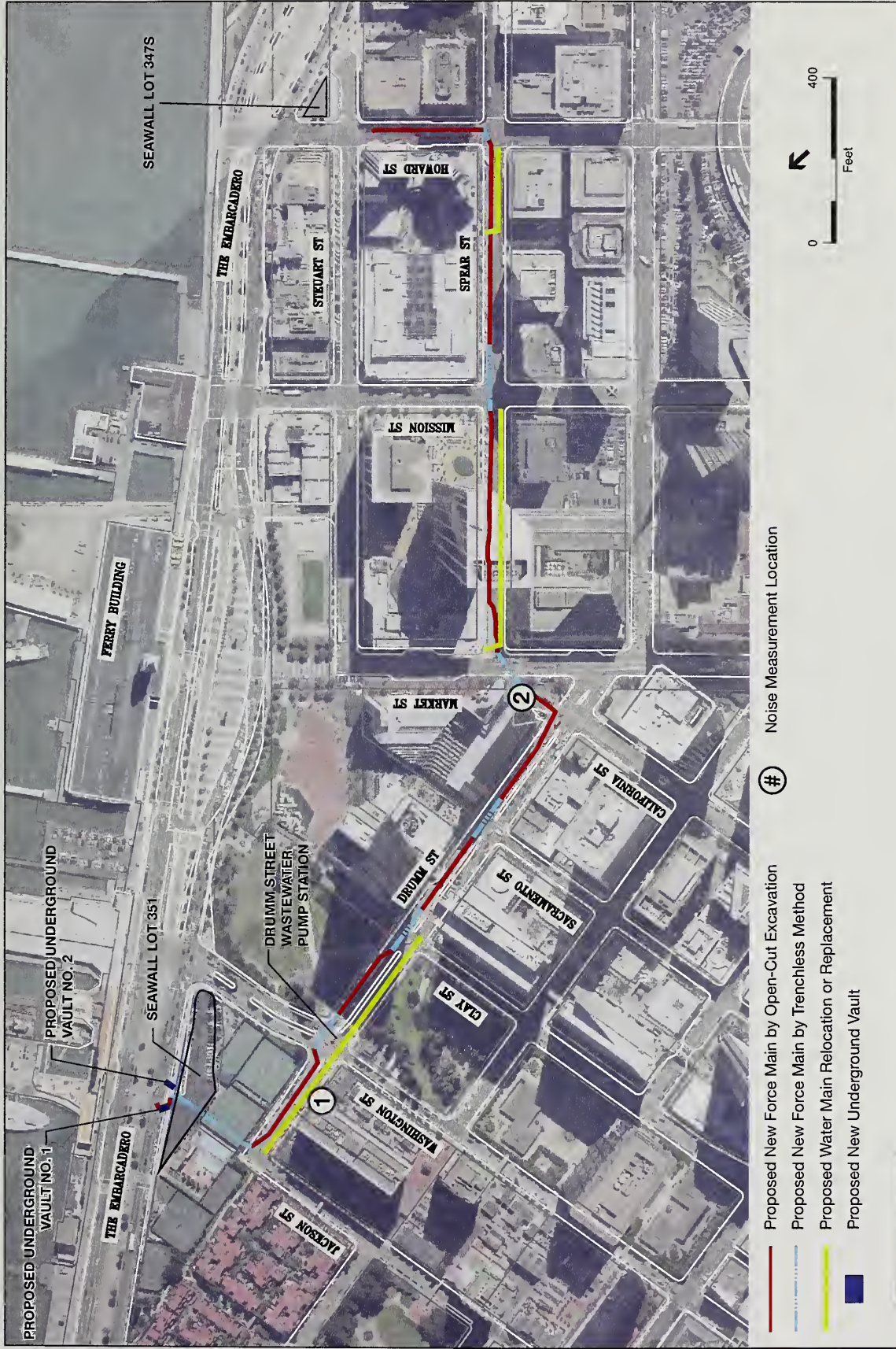
As indicated in Table 6, 24-hour noise levels are calculated to be 71 to 72 dBA (Ldn) adjacent to the project alignment,¹⁴ with measured noise levels of 67 to 69 dBA (Leq) during the day (7 a.m. to 10 p.m.) and 64 dBA (Leq) during the nighttime hours (10 p.m. to 7 a.m.).

Minimum nighttime noise levels were 58 dBA (Leq) at the Gateway on Drumm Street and 60 dBA (Leq) adjacent to the Hyatt Regency Hotel. During the day, noise sources at Measurement Location No. 1 included helicopter overflights, people playing tennis, passing cars, garage warning buzzers, and traffic on the Bay Bridge in the background. Sources at Measurement Location No. 2 included cable cars, cars, buses, skateboards, bells at the Ferry Building clock tower, and a saxophone.

Noise-Sensitive Receptors

Sensitive noise receptors are generally considered to include hospitals, skilled nursing/convalescent care facilities, schools, churches, libraries, and residences. Land uses within the project area are described in detail in Section E.1, Land Use and Land Use Planning. Parts of the project area are near residential uses, with most of these uses adjacent to the northern (Golden Gateway Commons and the Gateway) and southern (Rincon Center) ends of the project alignment. The Hyatt Regency Hotel is also adjacent to the new force main alignment at the Market Street pedestrian plaza. No schools, churches, or daycare facilities are adjacent to the project alignment. There are no hospital or skilled nursing/convalescent care facilities, nor are there any public libraries in the project area.

¹⁴ Ldn is a 24-hour noise level that adds a 10-dB penalty to nighttime noise levels between 10 p.m. and 7 a.m. to account for increased sensitivity to nighttime noise.



SOURCE: San Francisco Department of Public Works

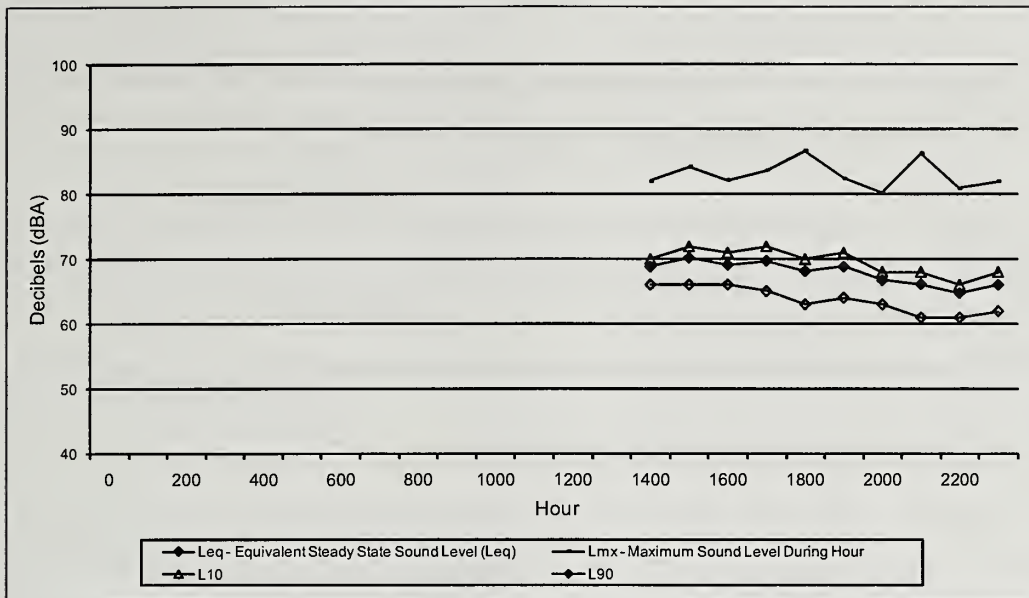
North Shore to Channel Force Main
Figure 9
 Noise Measurement Locations

TABLE 6
SUMMARY OF NOISE MEASUREMENT RESULTS

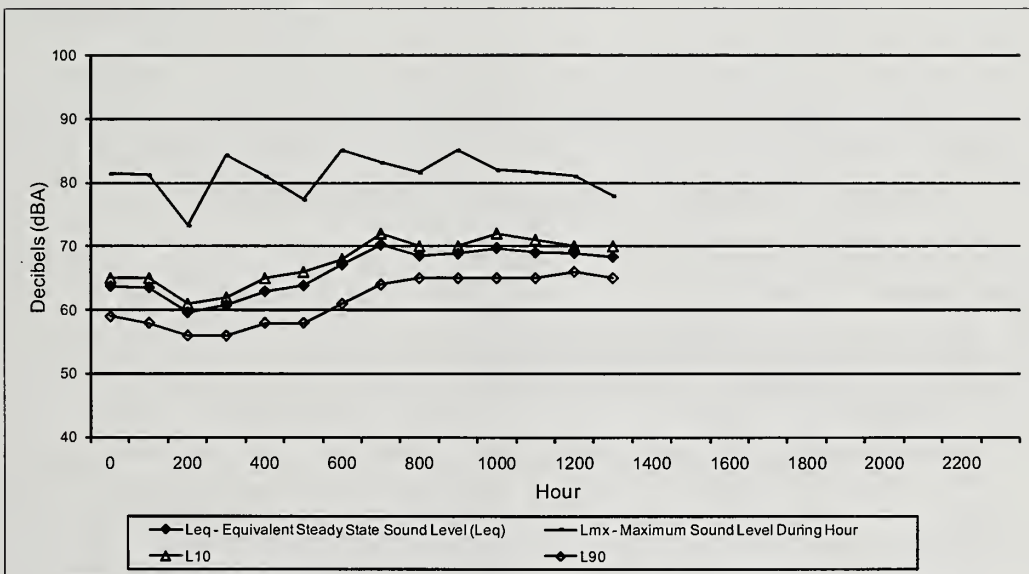
Time	Hourly Noise Level (Leq) Measurement Location No. 1: the Gateway (Drumm and Washington Streets)	Hourly Noise Level (Leq) Measurement Location No. 2: Hyatt Regency Hotel (California and Drumm Streets)
12:00 a.m. to 1:00 a.m.	59.8	63.7
1:00 a.m. to 2:00 a.m.	58.0	63.5
2:00 a.m. to 3:00 a.m.	63.6	59.6
3:00 a.m. to 4:00 a.m.	61.9	60.7
4:00 a.m. to 5:00 a.m.	59.9	62.9
5:00 a.m. to 6:00 a.m.	61.6	63.8
6:00 a.m. to 7:00 a.m.	70.8	67.1
7:00 a.m. to 8:00 a.m.	67.4	70.2
8:00 a.m. to 9:00 a.m.	68.3	68.5
9:00 a.m. to 10:00 a.m.	67.2	68.8
10:00 a.m. to 11:00 a.m.	67.3	69.7
11:00 a.m. to 12:00 p.m.	67.0	69.0
12:00 p.m. to 1:00 p.m.	66.5	68.9
1:00 p.m. to 2:00 p.m.	66.1	68.3
2:00 p.m. to 3:00 p.m.	66.6	68.9
3:00 p.m. to 4:00 p.m.	66.8	70.3
4:00 p.m. to 5:00 p.m.	67.2	69.2
5:00 p.m. to 6:00 p.m.	68.3	69.8
6:00 p.m. to 7:00 p.m.	66.2	68.2
7:00 p.m. to 8:00 p.m.	64.8	68.9
8:00 p.m. to 9:00 p.m.	63.8	66.8
9:00 p.m. to 10:00 p.m.	64.9	66.2
10:00 p.m. to 11:00 p.m.	62.8	64.8
11:00 p.m. to 12:00 a.m.	61.0	66.1
Daytime Leq (7 a.m. to 10 p.m.)	67	69
Nighttime Leq (10 p.m. to 7 a.m.)	64	64
Ldn (24 hours with 10-dBA penalty between 10:00 p.m. and 7 a.m.)	71	72

NOTE: See Figure 9 for noise measurement locations. Measurements were taken from 1:00 p.m. on Thursday, January 5, 2012 to 1:00 p.m. on Friday, January 6, 2012 using Metrosonics db-308 sound level meters. Measurement Location #1 is on the railing of the upper deck at Drumm and Washington Streets (the Gateway), approximately 50 feet from the pipeline alignment, and Measurement Location #2 is adjacent to the Hyatt Regency Hotel and Market Street Pedestrian Plaza, approximately 75 feet east of the Market Street/Spear Street intersection.

SOURCE: Environmental Science Associates (2012)



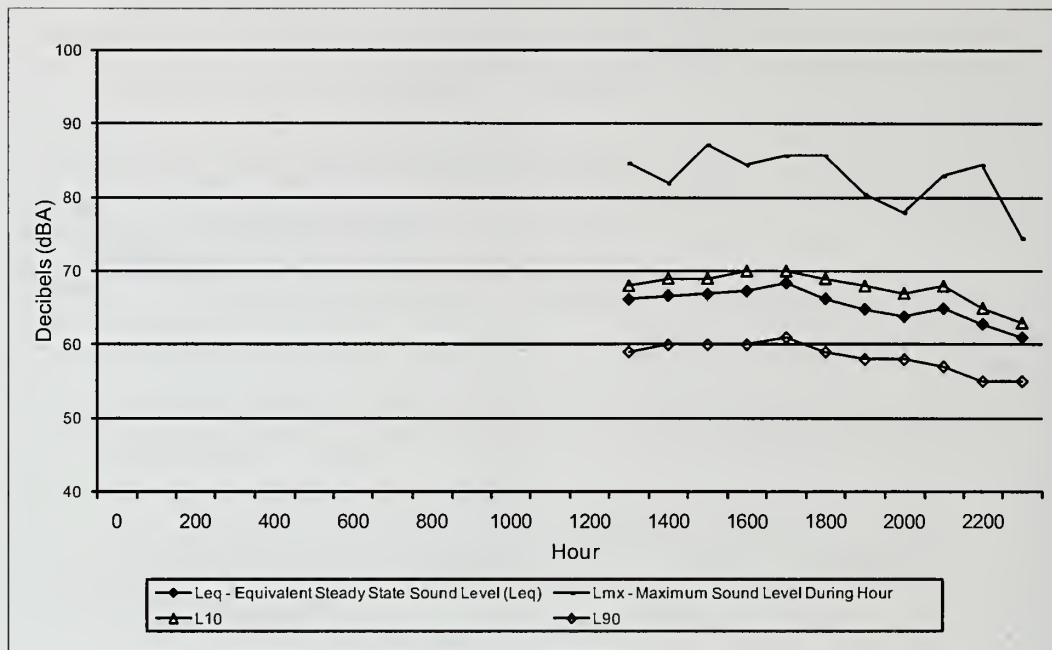
Thursday January 5, 2012



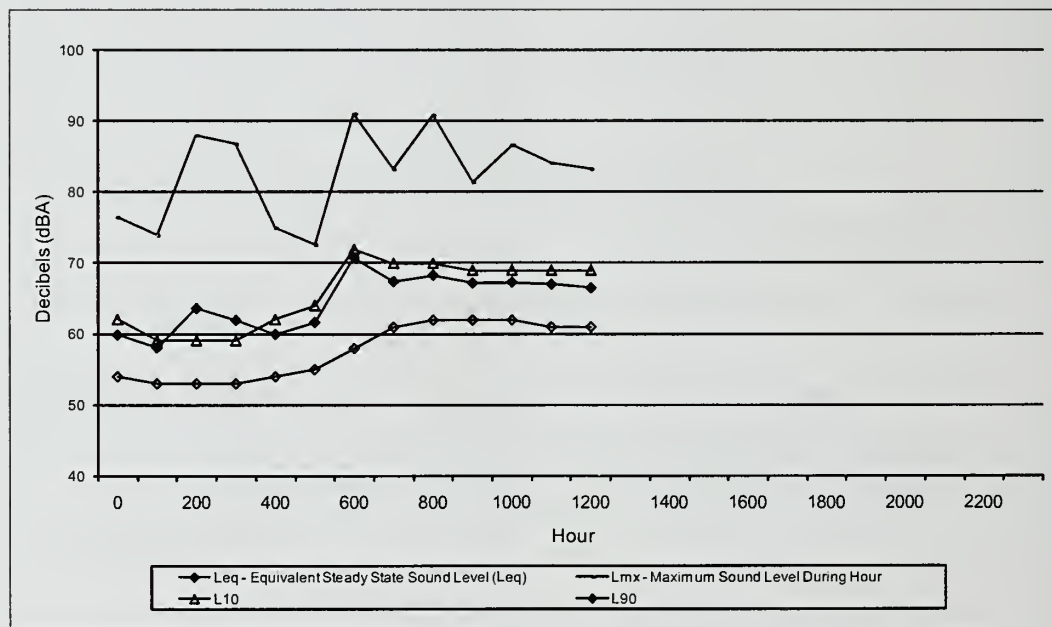
Friday January 6, 2012

North Shore to Channel Force Main Project

Figure 10
Measured Noise Levels at Location No. 2 -
Hyatt Regency Hotel,
California and Drumm Streets



Thursday January 5, 2012



Friday January 6, 2012

North Shore to Channel Force Main Project

Figure 11
Measured Noise Levels at Location No. 1 -
The Gateway Apartments,
Drumm and Washington Streets

Impact Assessment

Impact NO-1: The proposed project could result in exposure of persons to or generation of noise levels in excess of standards established in the San Francisco general plan or noise ordinance, or applicable standards of other agencies. (Less than Significant with Mitigation)

The project may potentially result in exposure of persons to noise levels in excess of standards established in the San Francisco Noise Ordinance without mitigation. The San Francisco Noise Ordinance (Article 29 of the *San Francisco Police Code*, revised November 25, 2008) regulates construction-related noise. Section 2907 limits noise levels from individual pieces of equipment to 80 dBA at 100 feet, which is equivalent to 86 dBA at 50 feet. Impact tools such as jackhammers and pile drivers are exempt from this noise limit if they are equipped with intake and exhaust mufflers approved by the Director of Public Works. Section 2908 allows for construction work during nighttime hours (defined by the code as 8 p.m. to 7 a.m.) as long as construction-related noise does not exceed the ambient noise level plus 5 dBA at the nearest property line or unless a special permit is granted by the Director of Public Works.

The types of construction equipment that would be used in the proposed project are listed in Table 1 in Section B, Project Description. Except for impact equipment such as sheetpile drivers and ramming/pneumatic hammers, the proposed equipment types typically generate maximum noise levels ranging from about 78 to 89 dBA at a distance of 50 feet from the source, as summarized in Table 7. This table also shows the noise reductions that would be required to comply with the ordinance noise limits during daytime hours. Most proposed equipment would comply with the equivalent daytime ordinance noise limit of 86 dBA at 50 feet, but some noisier types of equipment (pavers, cutters, and trucks) might be required to reduce noise by 2 or 3 dBA to comply with the ordinance limits, a *significant* impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-1, Administrative and Source Controls**, which requires installation of feasible engine controls¹⁵ as necessary to meet the ordinance noise limit of 80 dBA at 100 feet (or 86 dBA at 50 feet).

Construction of Vault No. 1 would entail operation of equipment during the nighttime hours (8 p.m. to 7 a.m.) for up to five weeks during installation of the road decking and up to six non-consecutive days during vault construction and tie-in to the existing force main. Construction of Vault No. 2 would include up to two non-consecutive days of nighttime construction for construction of the vault and tie-in to the

¹⁵ Source control reductions represent noise level reductions that are achievable with quieter procedures or engine controls, as specified by the U.S. Environmental Protection Agency (1971) and listed in Mitigation Measure M-NO-1. The U.S. EPA (1971) indicates that quieter procedures or engine controls can reduce noise from all types of construction equipment (except pile drivers) to 75 or 80 dBA at 50 feet.

existing force main. During this nighttime construction, allowable equipment noise would be limited to the ambient noise level plus 5 dBA at the nearest receptor, in accordance with the noise ordinance. Occasional nighttime construction activities could also occur throughout the remaining two months of Vault No. 1 construction, but heavy equipment would not be used. The minimum measured nighttime noise level next to the residences that are closest to the proposed vault locations was 58 dBA (Leq); therefore, the nighttime noise limit for the project at the vault locations would be 63 dBA (Leq). Table 8 also estimates nighttime construction-related noise levels for the proposed project at the Golden Gateway Commons and the Gateway, the closest sensitive receptors. As indicated in Table 8, without mitigation construction-related noise levels could exceed the 63-dBA (Leq) nighttime ordinance noise limit during construction of Vault Nos. 1 and 2, a *significant* impact. However, this impact would be reduced to a *less-than-significant* level with implementation of **Mitigation Measure M-NO-1, Administrative and Source Controls**, which requires installation of feasible engine controls¹⁶ as necessary to meet the ordinance noise limit of 63 dBA at the closest residential receptors. As indicated in Table 8, the mitigated noise levels would range from 56 to 59 dBA at the Golden Gateway Commons and the Gateway, well below the noise ordinance limit of 63 dBA.

When the SFPUC needs to shut down the North Shore Pump Station for over 10 hours, the construction contractor would operate two or three portable 12-volt pumps for approximately 30 to 36 hours in the vicinity of the Stevenson Street and Ecker Street intersection to divert sewage flows to local sewers. Two portable pumps would be located on the Ecker pedestrian way (near Market Street) at approximately 150 feet from the Ecker Building, the closest residential receptors to this intersection. If needed, an auxiliary 12-volt pump would be temporarily located approximately 40 feet from the Ecker Building residences, but would only operate during daytime hours (7 a.m. to 8 p.m.).

Manufacturer specifications indicate that each portable pump would generate 72 dBA (Leq) at 23 feet. Simultaneous operation of two pumps would generate a combined noise level of 75 dBA (Leq) at 23 feet. Such noise levels would be less than the equivalent daytime ordinance noise limit of 86 dBA at 50 feet.

¹⁶ Source control reductions represent noise level reductions achievable with quieter procedures or engine controls, as specified by the U.S. Environmental Protection Agency (1971) and listed in Mitigation Measure M-NO-1.

TABLE 7
ESTIMATED DAYTIME CONSTRUCTION NOISE LEVELS (dBA) AT THE CLOSEST SENSITIVE RECEPTORS

Project and Receptor Location	Construction Duration ^a (Construction Hours)	Maximum Noise Source	Reference Hourly Leq in dBA at 50 feet ^b	Distance Between Project and Closest Residential Receptors (Lowest Stories) ^c	Distance Adjustment	Leq Adjusted for Distance	With Required Compliance with Ordinance Limit of 80 dBA @ 100' or 86 dBA @ 50 ^d	Leq Adjusted for Ordinance Limit	Noise Reduction Measures (Mitigation Measure M-NO-1) ^e	Mitigated Leq With Controls	Speech Interference Threshold
<i>Vault Construction</i>											
Vault Nos. 1 and 2 Closest residential receptors on Drumm Street (Golden Gateway Commons and the Gateway)	Vault No. 1: 3 to 4 months Vault No. 2: 2 months (Weekdays, 7 a.m. to 6 p.m.)	Backhoe, Loader, Excavator	80	300	-16	64	0	64	0	64	70
		Drill Rig (for torque-down piles)	83	300	-16	67	0	67	0	67	70
		Various Trucks	88	300	-16	72	-2	70	0	70	70
		Crane, Compactor	83	300	-16	67	0	67	0	67	70
		Paver	89	300	-16	73	-3	70	0	70	70
		Pump, Saw	78	300	-16	62	0	62	0	62	70
<i>Open Trench Pipeline Construction</i>											
Pipeline segments on Drumm and Spear Streets from Jackson Street to Howard Street (between intersections) Closest residential receptors in the Golden Gateway Commons and The Gateway	Total duration: 8 months Force Main: 6 months Water Main: 2 months Progress along alignment: 100 feet/day so approximate duration at any receptor: 2 weeks (Weekdays, 7 a.m. to 6 p.m.)	Sheetpile Driver ^f – High	94	50	0	94	0	94	0	94	70
		Sheetpile Driver – Low	75	50	0	75	0	75	-6	69	70
		Backhoe, Loader, Excavator	80	50	0	80	0	80	-7	73	70
		Various Trucks	88	50	0	88	-2	86	-11	75	70
		Crane, Compactor	83	50	0	83	0	83	-8	75	70
		Paver	89	50	0	89	-3	86	-6	80	70
Market Street Pedestrian Plaza Closest sensitive receptors are guests staying at the Hyatt Regency Hotel	Total Duration: 1 month (Weekdays, 7a.m. to 6 p.m.)	Pump, Roller, Saw	78	50	0	78	0	78	-3	75	70
		Backhoe, Loader, Excavator	80	55	-1	68	0	68	0	68	70
		Compactor	83	55	-1	71	0	71	-1	70	70
		Saw-cutting machine	89	55	-1	77	-3	74	-4	70	70
<i>Trenchless Pipeline Construction</i>											
Intersection on Drumm Street at Washington Street Closest residential receptors in the Gateway	Total Duration: 2.5 months at each intersection Pit Excavation: 8 weeks Pile Driving for Pit Excavation: 2 days Pipeline Construction: 2 weeks (Weekdays, 7 a.m. to 6 p.m.)	Pump, Saw, Grout Pumping Plant ^g	78	55	-1	66	0	66	0	66	70
		Sheetpile Driver ^f – High	94	75	-4	90	0	90	0	90	70
		Sheetpile Driver – Low	75	75	-4	71	0	71	-6	65	70
		Pipe Ramming/Pneumatic Hammer ^h – High	96	75	-4	92	0	92	0	92	70
		Pipe Ramming/Pneumatic Hammer – Low	71	75	-4	67	0	67	0	67	70
		Backhoe, Loader, Excavator	80	75	-4	76	0	76	-6	70	70
Intersection on Spear Street at Howard Street Closest residential receptors on Floors 7 to 20 of Rincon Center fronting on Spear and Howard Streets	Total Duration: 2.5 months at each intersection Pit Excavation: 8 weeks Pile Driving for Pit Excavation: 2 days Pipeline Construction: 2 weeks (Weekdays, 7 a.m. to 6 p.m.)	Various Trucks	88	75	-4	84	-2	82	-12	70	70
		Crane, Compactor	83	75	-4	79	0	79	-9	70	70
		Paver	89	75	-4	85	-3	82	-12	70	70
		Pump, Roller, Saw	78	75	-4	74	0	74	-4	70	70
		Sheetpile Driver ^f – High	94	100	-6	88	0	88	0	88	70
		Sheetpile Driver – Low	75	100	-6	69	0	69	0	69	70
NOTES: Noise Levels in BOLD exceed the 70-dBA speech interference criterion.											

^a Although total duration for each phase is specified, actual noise-generating construction activities are expected to be intermittent over the entire construction duration.

^b Reference noise levels represent noise levels for similar equipment types (without controls) at 50 feet (U.S. FTA, 2006; U.S. EPA, 1971). These estimates assume that one piece of equipment would be operated 100 percent of the time at full throttle at the closest possible distance to the receptor. Although this worst-case assumption is unlikely, it is used to offset the variable proximity of multiple pieces of equipment operating along the pipeline alignment with variable throttle speeds and durations during any given hour.

^c Each distance represents the minimum distance between the receptor and the closest construction activity. The distances between a given receptor and multiple equipment noise sources would vary because the right-of-way is very narrow, which limits the potential for multiple pieces of equipment to operate simultaneously at the same distance from a receptor.

^d Impact tools, which include sheetpile hammers, are exempt from noise limits specified in Section 2907 of the Police Code. Therefore, no adjustment is made for required compliance with ordinance noise limits.

^e Source control reductions represent noise level reductions achievable with quieter procedures or engine controls, as specified by the U.S. Environmental Protection Agency (1971) and listed in Mitigation Measure M-NO-1.

^f Reference hourly noise level of 101 dBA (Lmax) applied but assumes maximum noise levels would occur during 20 percent of every 1-hour time period (12 minutes). Noise levels generated by a sheetpile driver can vary substantially if a vibratory impact pile driver can be used instead of an impact pile driver and if no substantial subsurface obstructions are encountered. The low to high range captures the potential variation in noise levels resulting these factors (i.e., impact vs. vibratory pile driver and subsurface obstructions vs. no obstructions).

^g A cement grout pumping plant would include a colloidal mixer, agitator, and hydraulic double-acting pump and is assumed to be enclosed in a metal box with doors that are kept closed during operation (WIA, 2001).

^h TT Technologies Rammer Sound Pressure Levels (SFPUC, 2011b). Reference hourly noise levels of 78 dBA (low Lmax) to 103 (high Lmax) applied but assume maximum noise levels (Lmax) would occur during 20 percent of the 1-hour time period (12 minutes). The low to high range captures the potential variation in noise levels resulting from use of quieter types of equipment.

SOURCE: Orion Environmental Associates (2012)

TABLE 8
ESTIMATED NIGHTTIME CONSTRUCTION NOISE LEVELS (dBA) AT THE CLOSEST SENSITIVE RECEPTORS

Project and Receptor Location	Construction Duration ^a (Construction Hours)	Maximum Noise Source	Reference Hourly Leq in dBA at 50 feet ^b	Distance Between Project and Closest Residential Receptors (Lowest Stories)	Distance Adjustment	Adjusted Leq	With Ordinance Limit of 80 dBA @ 100' or 86 dBA @ 50'	Adjusted Leq	Noise Reduction Measures (Mitigation Measure M-NO-1 ^d)	Mitigated Leq With Controls	Minimum Nighttime Ordinance Limit (Ambient+5 dB)
Vault Construction											
Vault Nos. 1 and 2 Closest residential receptors on Drumm Street (Golden Gateway Commons and the Gateway)	Night Work: Up to 5 weeks (Construction to occur weeknights and weekend nights)	Backhoe, Loader, Excavator	80	300	-16	64	0	64	-5	59	63
		Drill Rig	83	300	-16	67	0	67	-8	59	63
		Crane, Compactor	83	300	-16	67	0	67	-8	59	63
		Paver	89	300	-16	73	-3	70	-7	63	63
		Pump, Saw	78	300	-16	62	0	62	0	62	63

NOTES:

^a Although total duration for each phase is specified, actual noise-generating construction activities are expected to be intermittent over the entire construction duration.

^b Reference noise levels represent noise levels for similar equipment types (without controls) at 50 feet (U.S. FTA, 2006; U.S. EPA, 1971). These estimates assume that one piece of equipment would be operated 100 percent of the time at full throttle at the closest possible distance to the receptor. Although this worst-case assumption is unlikely, it is used to offset the variable proximity of multiple pieces of equipment operating along the pipeline alignment with variable throttle speeds and durations during any given hour.

^c Each distance represents the minimum distance between the receptor and the closest construction activity. The distances between a given receptor and multiple equipment noise sources would vary because the right-of-way is very narrow, limiting the potential for multiple pieces of equipment to operate simultaneously at the same distance from a receptor.

^d Source control reductions represent noise level reductions achievable with quieter procedures or engine controls, as specified by the U.S. Environmental Protection Agency (1971) and listed in Mitigation Measure M-NO-1.

SOURCE: Orion Environmental Associates, 2012

However, two of these pumps could also operate during the more sensitive nighttime hours and adversely affect any nearby sensitive receptors. The Ecker Building residences are located at the east corner of the Stevenson/Ecker intersection and would be subject to noise levels of up to 59 dBA (Leq) during the night when two pumps would operate 150 feet away. Nighttime ambient noise levels are expected to be slightly lower than those measured at residences on Drumm Street (minimum noise levels of 58 dBA Leq); and with an estimated nighttime ordinance limit of 60 dBA (55 dBA minimum noise level plus 5 dBA, Leq). 30 to 36 hours of pump operation is not expected to conflict with the ordinance nighttime noise limit, a *less-than-significant* impact.

The proposed temporary pumps at the Stevenson Street and Ecker Street intersection would also require construction of approximately 100 feet of new pipe at this intersection. Expected construction equipment used for this activity would be limited to a saw cutting machine, jackhammer and small trucks; excavation would be done mostly by hand due to the limited space and shallow excavation required. In addition, pipe construction would occur only during the daytime hours. Noise generated by small trucks are expected to meet the noise ordinance limit of 86 dBA at 50 feet, while jackhammers would be exempt from this limit. Therefore, pipe construction at this intersection would not conflict with the ordinance noise or time limits, a *less-than-significant* impact.

The project would also include operation of a forklift and small generator for six non-consecutive days to construct a temporary dam at the Jackson Street/Sansome Street intersection during shutdowns of the North Shore Pump Station. A small 8.5-kW propane-powered generator can generate noise levels of 65 dBA at 23 feet¹⁷ or 58 dBA at 50 feet, which would comply with daytime ordinance noise limit of 86 dBA at 50 feet. While this generator would operate during the more sensitive nighttime hours to power the night light for six non-consecutive nights, operation of this small generator is not expected adversely affect sensitive receptors since there are no noise-sensitive uses located at this intersection. Therefore, construction of the temporary dam would not conflict with the ordinance.

Mitigation Measure M-NO-1: Administrative and Source Controls.

The SFPUC shall ensure that the noise control plan required by the construction contract specifications is reviewed and approved by SFPUC, and is prepared and implemented by a qualified noise consultant, defined as a Board Certified Institute of Noise Control Engineering member or other qualified consultant or engineer approved by the project engineer. The SFPUC shall verify that the noise control plan contains at least the following elements:

¹⁷ Kohler Power Systems, 2009. Model: 8.5/12RES, Multi-Fuel LP Vapor/Natural Gas Specifications.

- *Daytime:* Construction noise levels shall not exceed the San Francisco Noise Ordinance daytime threshold of 80 dBA at 100 feet (or 86 dBA at 50 feet) at all locations between 7 a.m. to 8 p.m. or the exterior speech interference threshold of 70 dBA (Leq) between 7 a.m. and 10 p.m. at all residential receptors (except where construction activities occur for two weeks or less at one location).
- *Nighttime:* Construction noise levels shall not exceed the San Francisco Noise Ordinance nighttime threshold of 63 dBA (Leq) between 8 p.m. and 7 a.m. at residential property boundaries (or 5 dBA above ambient as determined as part of noise ordinance compliance baseline monitoring) and the sleep interference threshold of 60 dBA (Leq) between 10 p.m. and 7 a.m. at all residential receptors (including Golden Gateway Commons, the Gateway, and Ecker Building).

The noise control plan shall identify sensitive receptor locations and include measures that could be employed to maintain noise levels at or below these performance standards, such as the following:

- Implement best available noise control techniques such as mufflers, intake silencers, ducts, engine enclosures, acoustically attenuating shields or shrouds.
- Use hydraulically or electric-powered impact equipment (e.g., jack hammers, pavement breakers, and rock drills) to the extent feasible.
- Limit continuous operation of heavy equipment near sensitive receptors.
- Locate stationary noise sources (e.g., generators, fans, pumps) as far from sensitive receptors as possible and use noise controls (e.g., enclosures, barriers) as necessary.
- Use vibratory sheetpile drivers instead of impact sheetpile drivers for project facility construction to minimize pile driving-related noise.
- Where pipe ramming is used for trenchless pipeline construction, the contractor shall use the quietest type of pipe-ramming equipment available (i.e., TT Technologies Rammer David, 90 dB at 13 feet).
- The name and phone number of a SFPUC designated project liaison shall be posted at project facility construction sites so that the public can contact the liaison if noise disturbance occurs. This liaison shall immediately take steps to resolve any complaints received, including modifying construction practices as necessary to address the noise complaint.

Impact NO-2: During construction, the proposed project could result in a substantial temporary or periodic increase in groundborne vibration in the project vicinity. (Less than Significant with Mitigation)

As described in Section B, Project Description, the construction contract specifications would require the construction contractor to restrict any vibratory activities to peak particle velocities of 0.50 in/sec PPV or less at the closest adjacent structures for vibration activities less than 4 hours, and to peak particle velocities

less than 0.20 in/sec PPV for vibration activities over longer periods (a few days) to minimize the potential for damages to adjacent utilities and buildings during construction. To demonstrate compliance with these limits, the SFPUC would implement an Instrumentation and Monitoring Program in accordance with the contract specifications. For buried utilities, the analysis uses a higher threshold of 4.0 in/sec PPV. A lower significance threshold of 0.016 in/sec PPV is applied to nighttime construction activities for vibration-related annoyance at nearby residences. Typical vibration levels associated with operation of various types of construction equipment are listed in **Table 9**. As indicated in this table, project construction, particularly sheetpile driving and pipe ramming, could cause vibration that exceeds the threshold damage level or levels that could cause nighttime disturbance.

TABLE 9
VIBRATION LEVELS FOR CONSTRUCTION EQUIPMENT AT 25 FEET FROM RECEPTORS

Equipment	Peak Particle Velocity (PPV) (in/sec)
	At 25 Feet ^a
Pile Driver (Impact)	
Upper Range	1.518
Typical	0.644
Pile Driver (Sonic or Vibratory)	
Upper Range	0.734
Typical	0.170
Pipe Ramming (at surface) ^b	
Upper Range	0.70
Typical	0.12
Pipe Ramming (at buried utilities)	
Upper Range	0.35
Typical	0.06
Vibratory Roller/Compactor	0.210
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Jackhammer	0.035
Small Bulldozer	0.003

^a Except as noted below, vibration amplitudes for construction equipment at 25 feet are provided by the FTA, as obtained near various types of equipment, and assume normal propagation conditions.

^b Simcivic (Simcivic, 2001b) indicates that pipe ramming vibration is most likely comparable to pipe bursting vibration, based on the similarity of methods.

SOURCES: FTA, 2006, Simcivic, 2001a, WIA, 2012

The analysis below evaluates the potential to exceed applicable vibration thresholds at nearby structures and buried utilities. Note that the SFPUC would conduct a pre-construction building crack survey, which will include videotaping cracks on the exterior facades of buildings located adjacent to the project alignment prior to the beginning of construction to document existing conditions. Furthermore, SFPUC requires the construction contractor to monitor vibration levels generated during construction as described in Section B, Project Description, and implement corrective action such as loosening the soil with an auger prior to operating vibratory equipment, reducing the amount of time that vibratory equipment is used, utilizing soil mix columns (blending a cement grout with the in situ soil to form a stable soil column), or modifying existing operations to maintain vibrations below the threshold that may cause damage to adjacent facilities; SFPUC also requires the construction contractor to repair any vibration-related damage.

Threshold Damage and Nighttime Annoyance

Vault Construction. The 300-foot setback of vaults from the closest buildings to the west (Golden Gateway Commons and the Gateway) would reduce the potential for vibration impacts from vault construction. Although the Golden Gateway Tennis and Swim Club buildings are located approximately 80 feet from proposed vaults, these facilities are proposed for demolition in 2012 (during project construction) as part of the 8 Washington Street/Seawall Lot 351 project. If they are demolished as planned, there would be no adverse vibration effects on club buildings or facilities. If the buildings are not demolished, vibration levels generated by construction equipment such as bulldozers and loaded trucks would be approximately 0.028 in/sec PPV or less at 80 feet (club buildings) and 0.007 in/sec PPV or less at 300 feet (Golden Gateway Commons and the Gateway), and large vibratory compactors could generate levels as high as 0.066 in/sec PPV at 80 feet and 0.017 in/sec PPV at 300 feet. These levels are below the 0.5 in/sec PPV level for threshold damage, a *less-than-significant* impact. However, operation of vibratory compactors during nighttime hours could exceed the 0.016 in/sec PPV annoyance threshold at the closest residential receptors, a *significant* impact. This impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-2, Nighttime Vibration Controls**, which prohibits use of large vibratory compactors at vault locations during nighttime hours (10 p.m. to 7 a.m.).

Open-Trench Pipeline Construction. Sheetpile driving, which could be used to shore the pipeline trenches, would generate the highest levels of vibration of all the construction methods under consideration. Impact sheetpile installation could generate up to 1.518 in/sec PPV at 25 feet. The pipeline

trench would be as close as 25 feet to adjacent buildings; therefore, vibration levels from impact sheetpile driving would exceed the 0.5 in/sec PPV level for threshold damage. Vibratory sheetpile driving would generate lower vibration levels of 0.170 in/sec PPV (typical level) to 0.734 in/sec PPV (upper range) at 25 feet but would still have the potential to exceed the 0.5 in/sec PPV level of threshold damage if subsurface obstructions are encountered. Because the vibratory sheetpile driving is anticipated to encounter few or no subsurface obstructions, and because the contractor would be change sheetpile driving methods if necessary (such as loosening the soil with a drilling-auger prior to sheetpile-driving), it is expected that vibration levels below the 0.5 in/sec PPV threshold could be achieved. Therefore, vibration generated by sheetpile driving would be *less than significant* with required compliance with contract specifications (which limit vibration levels to 0.5 in/sec PPV or less at the closest adjacent structures for vibration activities less than 4 hours, and to less than 0.20 in/sec PPV for vibration activities over longer periods (a few days)) and use of the appropriate sheetpile driving equipment or implementing other shoring methods to control vibrations during shoring activities.

Operation of most other types of construction equipment identified for use in the project (bulldozers, backhoes, trucks, vibratory rollers/compactors, etc.) would generate substantially lower levels of vibration than sheetpile driving, and these levels would not exceed the 0.5 in/sec PPV threshold for continuous vibration at the closest structures. While operation of any large truck-mounted vibratory compactors could generate vibration levels that exceed this threshold if they are operated closer than 10 feet from adjacent buildings, required compliance with contractor specifications, which limit vibration levels from construction operations to 0.5 in/sec PPV, would ensure that this impact is *less than significant*.

Buried utilities are located close to the proposed pipeline alignment (less than 25 feet in some cases) and sometimes cross the alignment; and these utilities would be subject to construction-generated vibration. For buried pipelines located farther than 10 feet from any impact sheetpile driving activities and 5 feet from any vibratory sheetpile driving activities, vibration levels are not expected to exceed the 4.0 in/sec PPV damage threshold for buried pipelines. While the 4.0 in/sec PPV threshold could be exceeded for the utilities that cross the alignment, utilities within the pipeline trench would be supported and protected as required in contract specifications. Therefore, impacts on buried utilities would be *less than significant*.

Trenchless Pipeline Construction. Trenchless pipeline construction techniques would be employed at intersections on Drumm and Spear Streets. Sheetpile driving or shoring methods that produce less vibration would be required to construct a ramming pit and a receiving pit at each intersection. Once the pits are constructed, pipe-ramming equipment would be operated in the ramming pit. Both sheetpile

driving and pipe-ramming activities have the potential to generate vibration. Impact sheetpile installation could generate up to 1.518 in/sec PPV at 25 feet; the ramming pits are located 20 feet from some adjacent buildings (10 to 12 feet from one building at the Spear Street/Howard Street intersection). Therefore, vibration levels from impact sheetpile driving in the pits could exceed the 0.5 in/sec PPV threshold at the nearest buildings. Vibratory sheetpile driving would generate lower vibration levels of 0.170 to 0.734 in/sec PPV at 25 feet but could still exceed the 0.5 in/sec PPV threshold for continuous vibration (particularly at the building located 10 to 12 feet away). Because the sheetpile driving is expected to encounter few or no subsurface obstructions, vibration levels below the 0.5 in/sec PPV threshold could be achieved. Therefore, vibration generated by sheetpile driving would be *less than significant* with required compliance with contract specifications, which limit vibration levels from construction operations to 0.5 in/sec PPV and use of the appropriate pile driving equipment or other methods to control vibrations during pile driving.

Estimated vibration levels from the pipe-ramming construction method (Simicevic and Sterling, 2001) would attenuate to about 0.2 in/sec PPV at approximately 10.5 feet from the proposed pipeline. Because no buildings would be located closer than 10.5 feet from the ramming pits, it is expected that vibration effects on adjacent buildings would be *less than significant*.

An existing concrete encasement crosses under Market Street (above BART and Muni facilities); in this segment, the contractor would remove the existing sewer by hand from within the concrete casing. Once the existing sewer is removed, the new force main would be installed. These construction methods are not expected to generate substantial vibration because the highest vibration levels would be from trucks supporting the construction activities, a *less-than-significant* impact.

Mitigation Measure M-NO-2: Nighttime Vibration Controls.

The SFPUC shall require in the construction contract specifications that the construction contractor conforms to the following vibration standards and thresholds:

- Operation of large vibratory compactors as part of vault construction during nighttime hours (10 p.m. to 7 a.m.) shall be prohibited.
- The contractor shall maintain vibration levels below 0.016 in/sec PPV at the closest residential structures (including Golden Gateway Commons and the Gateway) for any construction activities that take place between 10 p.m. and 7 a.m.

Impact NO-3: The proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity. (No Impact)

Operation of the proposed pipeline would not result in a measurable increase in ambient noise levels above or below ground because no noise-generating equipment would be installed as part of the project. Therefore, there would be *no impact* on ambient noise levels as a result of project operation.

Impact NO-4: During construction, the proposed project could result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. (Less than Significant with Mitigation)

To address this CEQA significance criterion, a “substantial” noise increase is defined as an increase in noise to a level that causes interference with land use activities at nearby sensitive receptors during the day and/or night. One indicator that construction noise could interfere with daytime activities would be speech interference, and an indicator that construction noise could interfere with nighttime activities would be sleep interference.

This analysis uses the following criteria to define potential “substantial” noise impacts:

- *Speech Interference.* Speech interference is an indicator of impact on typical daytime and evening activities. The analysis uses a speech interference threshold, in the context of impact duration and time of day, to identify substantial increases in noise resulting from temporary construction activities. Noise peaks generated by construction equipment could interfere with speech at nearby private residences if the noise levels in the building interiors exceed 45 to 60 dBA. Because a typical building can reduce noise levels by 25 dBA with the windows closed (U.S. EPA, 1974), an exterior noise level of 70 dBA (Leq) at a receptor would maintain an acceptable interior noise environment of 45 dBA if windows remain closed at all times. For this analysis, a significant impact would result if exterior noise levels at a receptor remained above the 70-dBA speech interference threshold on consecutive days for longer than 2 weeks.¹⁸
- *Sleep Interference.* Based on available sleep criteria data, an interior nighttime noise level of 35 dBA is considered acceptable (U.S. EPA, 1974). Because buildings with windows closed reduce exterior noise levels by 25 dBA, an exterior noise level of 60 dBA at receptors would maintain an acceptable interior noise environment of 35 dBA. Given the local climate conditions (cool summer evenings) and measured nighttime ambient noise levels of 58 and 71 dBA (Leq) and nighttime Leq of 64 dBA, the exterior sleep interference threshold of 60 dBA is applied in this analysis.

¹⁸ Construction would take place during warm weather (summer and fall) when houses without air conditioning typically open windows for cooling. Construction-related noise could exceed the speech interference criterion inside homes if windows were open. Construction noise increases are considered to result in a significant noise impact if windows must remain closed for longer than 2 consecutive weeks to maintain acceptable interior noise levels.

The types of construction equipment that would be used for the proposed project are listed in Table 1 in Section B, Project Description. Except for impact equipment such as sheetpile drivers and ramming/pneumatic hammers, the types of equipment proposed for use in the project typically generate maximum noise levels ranging from about 78 to 89 dBA at a distance of 50 feet from the source. Table 7 indicates noise levels at 50 feet from the noise source for typical types of construction equipment that are proposed for use in the project and estimates daytime construction-related noise levels at the closest sensitive receptors. Table 8 identifies nighttime construction-related noise levels at the closest residential receptors based on the limited construction activities that would take place during the most noise-sensitive nighttime hours (10 p.m. to 7 a.m.).

Vault Construction. Construction of Vault No. 1 would entail operation of equipment during the nighttime hours (10 p.m. to 7 a.m.) for up to five weeks for construction and installation of the road decking and up to six non-consecutive days for vault construction and tie-in to the existing force main. Construction of Vault No. 2 would include up to two non-consecutive days of nighttime construction for construction of the vault and tie-in to the existing force main. Table 7 estimates daytime construction-related noise levels at the closest residential receptors, the Golden Gateway Commons and the Gateway. As indicated in Table 7, daytime construction noise levels would not exceed the 70-dBA speech interference threshold at the closest residential receptors. Therefore, noise-related impacts from daytime vault construction activities would be *less than significant*, and no noise mitigation would be required.

Table 8 estimates noise levels from vault construction activities during nighttime hours (10 p.m. to 7 a.m.) at the closest residential receptors. As indicated in this table, construction-related noise levels could exceed the 60-dBA (Leq) sleep interference threshold during construction of Vault Nos. 1 and 2, a *significant* impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-1, Administrative and Source Controls**, which requires implementation of quieter procedures or installation of feasible engine controls as necessary to meet the sleep interference threshold of 60 dBA (Leq) at the closest residential receptors.

Open-Trench Pipeline Construction. As indicated in Table 7, project-related construction noise could exceed the daytime 70-dBA speech interference threshold at the closest residential receptors as well as at offices adjacent to the pipeline alignment on Drumm and Spear Streets, although offices are not considered sensitive receptors. At the pipeline segments where open-trench construction is proposed, construction activities would exceed the 70-dBA speech interference threshold by up to 24 dBA without the use of noise controls, a *significant* impact. Implementation of **Mitigation Measure M-NO-1**,

Administrative and Source Controls, which requires quieter procedures and engine controls, would reduce noise levels to below the 70-dBA speech interference threshold at the closest receptors (see Table 7) for most of the construction period. If subsurface obstructions are encountered, vibratory sheetpile driving could exceed the 70-dBA threshold, but these instances are expected to be brief (up to 2 days) and limited to Spear Street (between Market and Howard streets) where buried, unreinforced concrete (4 to 6 inches thick) is known to be located. Despite these occasional exceedances of the 70-dBA speech interference threshold, noise impacts would be *less than significant* because the exposure duration at any given receptor would be less than 2 weeks and would therefore be considered temporary.

Pipeline construction at the Market Street pedestrian plaza would take place during daytime hours. Secant piles would be installed on this pipeline segment, and trench soils would be jet-grouted, avoiding the need for sheetpile driving to shore the pipeline trench. Table 7 shows estimated daytime construction-related noise increases at the Market Street pedestrian plaza. As indicated in this table, operation of certain types of construction equipment could exceed the daytime 70-dBA speech interference threshold at the closest sensitive receptors (Hyatt Regency Hotel) over a 1-month period, a *significant* impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-1, Administrative and Source Controls**, which requires quieter procedures or installation of feasible engine controls as necessary to meet the 70-dBA speech interference threshold at the closest residential receptors.

Trenchless Pipeline Construction. Trenchless pipeline construction techniques would be employed at intersections on Drumm and Spear Streets to minimize traffic disruption and avoid potential utility conflicts. This technique would entail extended construction activities (2.5 months) at each intersection, and construction of a ramming and a receiving pit would be necessary at each intersection, including sheetpile driving for shoring installation. Once the pits are constructed, pipe-ramming equipment would be operated in the ramming pit. Noise increases resulting from daytime sheetpile driving and pipe-ramming activities as well as other construction activities have been estimated for two intersections where residential receptors are located. Table 7 shows the results. Office buildings adjacent to these intersections would be subject to the same noise levels but are not considered sensitive receptors.

As indicated in Table 7, noise associated with sheetpile drivers and pipe-ramming hammers could exceed the daytime 70-dBA speech interference threshold at the closest residential receptors if impact sheetpile drivers and noisier pipe-ramming equipment are used and if subsurface obstructions are encountered. Because construction at these intersections would last longer than 2 weeks, these potential noise increases

would be a *significant* impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-NO-1, Administrative and Source Controls**, which requires quieter sheetpiling and ramming equipment. These measures would reduce sheetpile driving and pipe-ramming noise as well as noise from other construction equipment to below the 70-dBA speech interference threshold at the closest residential receptors (see Table 7, Sheetpile Driver – Low and Pipe Ramming – Low).

Construction-related Truck Traffic Noise. Construction haul and delivery trucks would access the site using truck routes delineated in Figure 3. This increase in truck traffic compared to existing conditions would contribute incrementally to traffic noise along these streets.

Truck noise levels depend on vehicle speed, load, terrain, and other factors. The effects of construction-related truck traffic would depend on the pre-existing level of background noise at a particular sensitive receptor. In quiet noise environments such as residential neighborhoods that are protected by structural or topographic sound barriers (Leq averaging 50 dBA), one truck per hour would be noticeable even though such a low volume would not measurably increase noise levels. In slightly noisier environments, such as freeway interchanges, where sensitive receptors are not protected by structural or topographic sound barriers (Leq averaging 60 dBA), the threshold level is higher, and 10 trucks per hour would be required to noticeably increase noise, as calculated per Caltrans methodology; in moderately noisy environments (Leq averaging 70 dBA), a noise increase would be perceptible with the addition of 100 trucks per hour (Caltrans, 1998).

According to background noise levels estimated for San Francisco streets (San Francisco Department of Public Health, 2009), existing traffic noise levels along streets designated as proposed truck routes for this project range from 60 dBA (Ldn) to more than 70 dBA (Ldn). Based on the Ldn-Leq (day) relationship in noise measurements collected in the project vicinity, Leq noise levels along these streets are likely approximately 3 to 4 dBA less than the Ldn levels. With this adjustment, ambient noise levels along streets designated as proposed truck routes range between 56 and 67 dBA (Leq) in the project area. Therefore, increases of up to 10 trucks per hour would be noticeable but less than significant. As discussed in Section E.5, Transportation and Circulation, the project would generate construction-related truck traffic during the daytime between 9 a.m. and 3 p.m., and the maximum number of truck trips would be approximately 8 trucks per hour on city streets. Therefore, truck traffic noise impacts on city streets would be *less than significant*.

North Shore Force Main and North Shore Pump Station Shutdowns. During construction, up to six shutdowns of the existing North Shore Force Main and North Shore Pump Station would be required for work related to Vault No. 1 and up to two shutdowns of the existing North Shore Force Main would be required for work related to Vault No. 2. Prior to these shutdowns, three short segments of 8-inch ductile iron pipe (totaling approximately 100 feet) would be installed below ground at the Stevenson Street and Ecker Street intersection to facilitate sewer diversion. Operation of saw-cutting machines and jackhammers at this intersection would exceed the 70-dBA speech interference threshold at adjacent residences in the Ecker Building. However, noise impacts associated with pipe construction would be *less than significant* because the exposure duration at the adjacent residential receptors would be less than 2 weeks and would therefore be considered temporary.

Proposed operation of two or three portable 12-volt pumps for approximately 30 to 36 hours in the vicinity of the Stevenson Street and Ecker Street intersection would generate temporary noise increases at adjacent office buildings as well as at residences in the Ecker Building, the closest sensitive receptor. Two portable pumps would be located on the Ecker pedestrian way (near Market Street) at approximately 150 feet from the Ecker Building, the closest residential receptors to this intersection. If needed, a temporary auxiliary 12-volt pump would be located approximately 40 feet from the Ecker Building residences, but would only operate during peak times during the daytime hours (7 a.m. to 8 p.m.). Simultaneous operation of two pumps would generate a combined noise level of 75 dBA (Leq) at 23 feet.

Daytime operation of all three pumps would generate noise levels of 68 dBA (Leq) at the closest residences in the Ecker Building (two pumps at 150 feet away and one pump 40 feet away). Such temporary daytime noise increases would be *less than significant* because they would not exceed the 70-dBA speech interference threshold at these residences. Nearby office and commercial uses would also be subject to similar noise levels or slightly higher where closer to the proposed pumps, but such noise increases would be *less than significant* since they would occur for less than two weeks. These pumps could also operate during the more sensitive nighttime hours and residences at the Ecker Building would be subject to noise levels of up to 59 dBA (Leq) during the night when two pumps would operate 150 feet away. Such levels would be *less than significant* since they would not exceed the 60-dBA (Leq) sleep interference threshold at the closest residential receptors.

The project would also include operation of a forklift and small generator for six non-consecutive days at the Jackson Street/Sansome Street intersection. Operation of such equipment is not expected to have a significant adverse noise impact on any sensitive receptors because office and parking uses located

adjacent to this intersection are not noise-sensitive and the generator would only operate for six non-consecutive nights.

Impact NO-5: The proposed project is not located within 2 miles of a public airport or in the vicinity of a private airstrip (Not Applicable)

The nearest airports to the project area are San Francisco International Airport approximately 11 miles to the south and Oakland International Airport approximately 11 miles to the southeast. Therefore, impacts related to location within an airport land use plan, within 2 miles of a public airport, and in the vicinity of a private air strip are *not applicable*.

Impact NO-6: The project would not be adversely affected by existing noise levels. (Not Applicable)

The proposed project does not include construction of any aboveground features, and, as discussed in Section E.3, Population and Housing, would not introduce any new people to the project area. Therefore, the proposed project would not be affected by existing noise levels and this impact is *not applicable* to the proposed project.

Impact C-NO: The proposed project, in combination with past, present, and reasonably foreseeable future projects, could result in significant cumulative noise and vibration impacts. (Less than Significant with Mitigation)

Noise and vibration impacts of the proposed project would be limited to the project area and immediate vicinity; therefore, the geographic scope of potential cumulative noise and vibration impacts encompasses the project area and immediate vicinity. The geographic scope for noise also includes areas adjacent to construction haul routes.

Of the cumulative projects listed in Table 3, only the 8 Washington Street/Seawall Lot 351 project would be located in the immediate vicinity of the proposed project (at the northern portion of the proposed project area) and would have the potential to contribute to cumulative noise impacts. Construction of this mixed-use project is pending approval and scheduled to begin in July 2012, and is thus expected to overlap with construction of the force main project. Cumulative noise increases from construction of the 8 Washington Street/Seawall Lot 351 project combined with construction of the proposed force main project could exceed the daytime 70 dBA speech interference threshold at the Golden Gateway Commons and the Gateway, two residential developments located adjacent to the 8 Washington Street/Seawall Lot 351 site and the proposed project's pipeline alignment in Drumm Street, a *significant* cumulative impact and the project's contribution

could be cumulatively considerable. However, as indicated in Table 7, the proposed project's daytime construction noise levels would generally be reduced to below the 70-dBA threshold with implementation of engine controls and quieter construction methods (**Mitigation Measure M-NO-1: Administrative and Source Controls**), and would not exceed a duration of 2 weeks at locations where the speech interference threshold would be exceeded. With implementation of this measure, the project's residual contribution to cumulative noise increases would not be cumulatively considerable (*less than significant*).

Because construction of the 8 Washington Street/Seawall Lot 351 project would take place during the daytime hours (within ordinance construction time limits), there would be no cumulative, construction-related nighttime noise or vibration impacts.

As discussed in Impact NO-2, the proposed project would generate vibration from sheetpile installation and other construction activities, which could damage adjacent structures. The 8 Washington Street/Seawall Lot 351 project would also include pile driving, although its pile driving activities would be located further from adjacent structures than the project. It is conservatively assumed that vibration increases from pile driving under this project combined with vibration related to the proposed project could exceed the 0.5 in/sec PPV for threshold damage at the Golden Gateway Commons and the Gateway, two residential developments adjacent to the 8 Washington Street/Seawall Lot 351 site and the project's pipeline alignment in Drumm Street. Therefore, cumulative impacts related to vibration are *significant*. However, the project's contribution would not be cumulatively considerable because the contract specifications would require the contractor to limit vibrations to 0.5 in/sec at the closest structure (*less than significant*).

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than-Significant Impact	No Impact	Not Applicable
7. AIR QUALITY—Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The BAAQMD is the regional agency with jurisdiction over the nine-county Bay Area Air Basin. BAAQMD is responsible for attaining and maintaining air quality in the Air Basin within federal and State air quality standards (BAAQMD, 2011a). Specifically, BAAQMD has the responsibility to monitor ambient air pollutant levels throughout the Air Basin and to develop and implement strategies to attain the applicable federal and State standards. The BAAQMD adopted updated *California Environmental Quality Act (CEQA) Air Quality Guidelines*, including new thresholds of significance, in June 2010 and revised them in May 2011 (BAAQMD, 2011b). These guidelines specify methodologies for evaluating potential air quality impacts and applying the new thresholds of significance. This analysis uses the updated June 2010 - May 2011 thresholds and methodologies from the BAAQMD *CEQA Air Quality Guidelines* to evaluate the potential impacts of construction and operation of the proposed project. Although BAAQMD's adoption of the significance thresholds in 2010 and 2011 are the subject of recent judicial actions, the Planning Department has determined that Appendix D of the BAAQMD *CEQA Air Quality Guidelines*, in combination with BAAQMD's *Revised Draft Options and Justification Report* (BAAQMD, 2009), provide substantial evidence to support the BAAQMD recommended thresholds and, therefore, has determined they are appropriate for use in this analysis.

Construction of the proposed project could cause short-term air quality impacts. There would be no long-term impacts from project operation because the proposed project would not construct new sources of air emissions, nor would the project result in changes to existing air emissions from the SFPUC's wastewater system. Project construction would generate particulate matter (dust) primarily as a result of fugitive dust sources. Construction-related exhaust emissions would also contain both criteria pollutants and toxic air contaminants (TACs) from offroad equipment, worker vehicles, and haul trucks.

The SFPUC conducted a health risk analysis (HRA) to evaluate potential public health effects of the project-related construction emissions (Environ, 2012) and the discussion of Impacts AQ-1 and AQ-2 are based on the results of this analysis. As input to this analysis, the SFPUC provided construction equipment inventories with details on the type, horsepower, quantity, fuel, construction schedule, and hours of operation anticipated for each piece of equipment to be used during construction. U.S. EPA's Tier 2

emissions standards, modified to reflect requirements of San Francisco's Clean Construction Ordinance (Ordinance No. 70-07), were used to estimate emissions from diesel-fueled construction equipment. The modifications based on the Clean Construction Ordinance include use of 20 percent biodiesel (B20). Criteria air pollutant emissions from project construction were estimated using OFFROAD2011 emission factors for stationary equipment and EMFAC2011 emissions factors for on-road trucks. Haul truck emissions were calculated using maximum total number of daily truck trips estimated by SFPUC and emission factors from CARB's EMFAC2011 model, based on a 14.7-mile one-way trip length.

Impact AQ-1: Implementation of the proposed project would not conflict with or obstruct the local applicable air quality plan, violate an air quality standard or contribute substantially to an existing or projected air quality violation. (Less than Significant)

Construction -Related Criteria Pollutant Emissions

Criteria pollutants from each construction phase and from offsite haul trucks were added and then averaged over the 275-workday construction period, which includes weekdays between May 1, 2012 and June 30, 2013, excluding the period during which San Francisco's Holiday Moratorium on street and sidewalk construction would be in effect on streets subject to this moratorium. Although some construction might occur during the weekend these days were excluded from the calculation of average daily construction emissions in order to generate conservative estimates that overestimate emissions. In all cases, emissions of the criteria pollutants ROG, NO_x, PM₁₀, and PM_{2.5} were below the BAAQMD daily mass emissions thresholds for criteria air pollutants, as shown in Table 10. Consequently, impacts from construction-related emissions of criteria pollutant emissions would be *less than significant*.

TABLE 10
AVERAGE DAILY CONSTRUCTION-RELATED CRITERIA POLLUTANT EMISSIONS (POUNDS/DAY)^a

Year	ROG	NO _x	Exhaust PM ₁₀ ^b	Exhaust PM _{2.5} ^b
2012/2013 Unmitigated Emissions	1.0	12.7	0.4	0.4
2012/2013 Mitigated Emissions ^c	0.7	12.9	0.3	0.3
BAAQMD Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

^a See Environ (2012) for supporting detail on how construction emissions were calculated.

^b BAAQMD's proposed construction-related significance thresholds for PM₁₀ and PM_{2.5} apply to exhaust emissions only and not to fugitive dust.

^c Mitigation measures reflect application of diesel particulate filters to reduce impacts related to increased cancer risks (discussed in Impact AQ-2).

SOURCES: Environ, 2012; BAAQMD, 2011b

Construction-Related Fugitive Dust Emissions

Article 22B of the San Francisco Health Code (generally referred to as the Construction Dust Control Ordinance (Ordinance 176-08, effective July 30, 2008) specifies requirements for reducing the quantity of dust generated during site preparation, demolition, and construction work. The goals of the code are to protect the health of the general public and of onsite workers, to minimize public nuisance complaints. In accordance with Article 22B, all site preparation work, demolition, or other construction activities within San Francisco must comply with specified dust control measures if these activities have the potential to create dust or to expose or disturb more than 10 cubic yards or 500 square feet of soil. The requirement applies whether or not the activities require a permit from the Department of Building Inspection (DBI).

In addition, the SFPUC and construction contractor would use dust suppression practices to control construction dust on the project site in accordance with Article 22B. Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne. Increased watering frequency may be necessary whenever wind speeds exceed 15 mph. Reclaimed water must be used to the extent feasible as required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code; however, an exemption may be allowed for the use of potable water if there are public health concerns with the use of reclaimed water. Contractors would be required to provide as much water as necessary to control dust without creating earth movement or runoff. During excavation and dirt-moving activities, the contractor would be required to wet sweep or vacuum, at the end of the workday, the streets, sidewalks, paths, and intersections where work is in progress. Inactive stockpiles (not disturbed for more than seven days) that include more than 10 cubic yards or 500 square feet of excavated materials, backfill material, import material, gravel, sand, road base, and soil would be covered with a 10-millimeter (0.01-inch) polyethylene plastic (or equivalent) tarp and braced down. Other practices that result in equivalent dust control and are acceptable to the DBI may be implemented.

Because the project would disturb more than 28,000 square feet of soil (i.e., more than one-half acre), the contractor would have to submit a Dust Control Plan for approval by the San Francisco Public Health Department in accordance with the Dust Control Ordinance. The Dust Control Plan would include a map showing all sensitive receptors within 1,000 feet of the site and would analyze wind direction.

The SFPUC would be required to designate an individual to monitor compliance with dust control measures. Implementation of the dust control measures and dust control plan required by the Dust Control Ordinance would ensure that impacts resulting from construction-related emissions of fugitive dust are *less than significant*.

Impact AQ-2: Implementation of the proposed project could expose sensitive receptors to substantial pollutant concentrations. (Less than Significant with Mitigation)

TACs are air pollutants that can cause serious illness or increased mortality even when present in relatively low concentrations. There are hundreds of different types of TACs with varying degrees of toxicity. For the proposed project, the TAC of greatest concern is diesel particulate matter (DPM) that would be emitted by heavy equipment during construction. Once construction is complete, the project would not generate an increase in traffic; thus, there would be no increase in particulate matter from vehicle traffic during project operation.

The BAAQMD *CEQA Guidelines* recommend thresholds for risks and hazards associated with TAC emissions from an individual project that is undergoing CEQA review. Consistent with the recommendations and methodology of these guidelines, the HRA prepared for the proposed project evaluates the estimated cancer risk, non-cancer chronic and acute hazard indices (HIs), and PM_{2.5} concentrations associated with diesel exhaust that would be emitted by heavy equipment used during construction (Environ, 2012).

The HRA follows the BAAQMD *Recommended Methods for Screening and Modeling Local Risks and Hazards* (2011c), the California Air Pollution Control Officers Association (CAPCOA) *Health Risk Assessments for Proposed Land Use Projects* (2009), and California Office of Environmental Health and Hazard Assessment (OEHHA) guidance for air modeling required in HRAs. The results of the health risk analyses are compared with the BAAQMD significance thresholds for single-source impacts as follows:

An excess lifetime cancer risk level of more than 10 in one million

A non-cancer (both chronic or acute) HI greater than 1.0

An incremental increase in the annual average PM_{2.5} of greater than 0.3 micrograms per cubic meter (µg/m³)

Health Risk Analysis

Existing receptors in the vicinity of the project site would be exposed to TAC emissions generated during project construction. Although the actual types of construction equipment used and the location of the equipment would vary throughout the construction period, the HRA conservatively assumes that the maximally exposed individual sensitive receptor (MEISR) would be exposed to the annual average TAC concentration throughout the construction period. For the purpose of this analysis, it was conservatively assumed that the MEISR in this case represents an infant at the residential receptors.

The HRA determined that the incremental cancer risk for the MEISR would be 2.9 in one million, which is below the BAAQMD threshold of 10 in one million. Thus, incremental cancer risks from the project would be below the BAAQMD threshold (*less than significant*).

TAC exposure from the project's construction emissions would result in a chronic hazard quotient (equivalent to the HI) of 0.006, which is well below the BAAQMD threshold of 1.0 (*less than significant*). Results of the analysis also indicate that the maximum annual average PM_{2.5} concentration would be 0.03 µg/m³ at the MEISR, which is below the BAAQMD's significance threshold of 0.3 µg/m³ (*less than significant*).

TAC exposure from the project's construction emissions would result in an acute hazard quotient of 1.6, which exceeds the BAAQMD threshold of 1.0. Therefore, acute health impacts at existing receptors would be *significant*. Implementation of **Mitigation Measure M-AQ-2, Construction Emissions Minimization**, requiring the use of level-3 verified emissions control devices (VECDs) (i.e., diesel particulate filters) on certain pieces of construction equipment, would reduce the acute hazard quotient at the MEISR to 0.9, less than the BAAQMD threshold of 1.0. Consequently the acute hazard impact would be less than significant with mitigation.

Mitigation Measure M-AQ-2: Construction Emissions Minimization

To reduce the potential acute hazard impact resulting from project construction activities, the SFPUC shall reduce construction emissions of DPM from off-road construction equipment by 50 percent as compared to that estimated under the unmitigated scenario. This may be accomplished through the following requirements:

- All excavators, loaders, and cranes must be equipped with California Air Resources Board (CARB) Level 3 verified emissions control device (VECD) in the form of a diesel particulate filter.
- The SFPUC shall ensure that the above requirements are written into contract specifications including the requirement for the contractor to submit a comprehensive inventory of excavators, loaders, and cranes including each piece of equipment's license plate number, horsepower rating, engine production year, and confirmation that the equipment contains a Level 3 abatement device verified by the California Air Resources Board. The contractor shall update the inventory and submit it monthly to the SFPUC throughout the duration of the project.

Should the SFPUC choose to comply with this mitigation measure through any means other than the requirements listed above, the SFPUC shall prepare a Construction Emissions Minimization Plan demonstrating an equivalent emissions reduction. The Construction Emissions Minimization plan shall be submitted for approval to the Environmental Review Officer (ERO) for review by an Environmental Planning Air Quality Specialist prior to the commencement of construction activities.

Impact AQ-3: The proposed project would not create objectionable odors affecting a substantial number of people. (No Impact)

The project would install a new force main, construct belowground vaults, and replace and relocate water mains, none of which would produce new odors or cause changes in odors in the project area. Therefore, the project would have *no impact* related to creation of objectionable odors that could affect a substantial number of people. Moreover, the project would reduce the risk of discharge of untreated wastewater into the San Francisco Bay, which would reduce the potential for future odor emissions, a beneficial impact.

Impact C-AQ: The proposed project, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard; but could result in a cumulatively considerable contribution related to exposure of sensitive receptors to substantial pollutant concentrations. (Less than Significant with Mitigation)

Cumulative Criteria Air Pollutant Impacts

According to the BAAQMD, no single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. In addition, according to the BAAQMD *CEQA Air Quality Guidelines*, if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts on the region's existing air quality conditions (BAAQMD, 2011b). Alternatively, if a project does not exceed the identified significance thresholds, then the project's contribution would not be considered cumulatively considerable.

Cumulative Criteria Pollutant Emissions

As described above in Impact AQ-1, project-related criteria pollutant emissions during construction would not exceed BAAQMD thresholds either before or after implementation of **Mitigation Measure M-AQ-2** and would be less than significant. Thus, the project's contribution to cumulative emissions of criteria pollutants would not be cumulatively considerable. (*less than significant*)

Cumulative Health Risk and Hazard Impacts

The HRA prepared for the project follows the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks and Hazards* (2011c), CAPCOA *Health Risk Assessments for Proposed Land Use Projects*

(2009), and OEHHA guidance for air modeling required in HRAs. The results of the health risk analyses are compared to the BAAQMD significance thresholds for cumulative impacts as follows:

An excess lifetime cancer risk level of more than 100 in one million

A chronic non-cancer HI greater than 10.0

An incremental increase in the annual average PM_{2.5} of greater than 0.8 µg/m³

The revised BAAQMD *CEQA Air Quality Guidelines* require a cumulative analysis of all TAC emissions sources within 1,000 feet of the project boundary, at the MEISR for a project. The cumulative portion of the HRA evaluation includes stationary sources (such as diesel-fueled standby emergency generators), major roadways (defined by BAAQMD as traffic of more than 10,000 vehicles per day), and other known construction projects in the area. Because the project layout is linear, cumulative impacts were calculated for all sources within 1,000 feet of the MEISR.

The HRA for the project indicates that there are eight permitted operations with stationary sources within 1,000 feet of the MEISR. All are diesel engines associated with either generators or pumps (Environ, 2012). These sources have a lifetime excess cancer risk contribution of 35 in one million at the MEISR. The chronic hazard health index at the MEISR is 0.01, and the PM_{2.5} concentration contributed by these sources is 0.05 µg/m³.

The only major roadway (>10,000 vehicles per day) within approximately 1,000 feet of the MEISR would be The Embarcadero, which has a lifetime excess cancer risk contribution of 3.5 in one million at the MEISR. The PM_{2.5} concentration at the MEISR from roadway traffic on The Embarcadero is 0.06 µg/m³, and the chronic and acute health indices are less than 0.02 and therefore considered negligible.

Four additional construction projects are within 1,000 feet of the project's MEISR that could contribute to cumulative health risks and hazards: 1) the 8 Washington Street/Seawall Lot 351 project, which involves demolition of Golden Gateway Tennis and Swim Club and construction of two mixed-use buildings and recreational facilities; 2) the 34th America's Cup project; 3) the James R. Herman Cruise Terminal project; and 4) the SFDPW pavement renovation project that includes repavement of the streets common to the alignment of the proposed project. It is estimated that these construction projects contribute a lifetime excess cancer risk contribution of 113 in one million at the MEISR. The chronic hazard health index at the MEISR is 0.12 from these construction projects, and the PM_{2.5} concentration contributed by these sources is 0.64 µg/m³.

An additional source that was considered in the cumulative scenario is marine operations at the ferry terminal, which is located within 1,000 feet of the MEISR. Diesel ferry operations at the ferry terminal contribute a lifetime excess cancer risk contribution of 30 in one million at the MEISR. The chronic hazard health index at the MEISR is 0.01 from ferry operations, and the PM_{2.5} concentration contributed by these sources is 0.1 µg/m³.

Table 11 shows the total contribution of non-project sources within 1,000 feet of the project MEISR with implementation of mitigation. The cumulative lifetime excess cancer risk (182 in one million) and the cumulative PM_{2.5} concentrations (0.85 µg/m³) exceed BAAQMD cumulative significance criteria without the proposed project. Consequently, to determine whether the proposed project would have a significant cumulative impact, it is necessary to determine whether the proposed project would result in a cumulatively considerable contribution to this existing cumulative impact. As indicated by the data in Table 11, the proposed project would contribute less than 2 percent of the predicted cumulative lifetime excess cancer risk and PM_{2.5} emissions. **Mitigation Measure M-AQ-2** would further reduce the project's DPM emissions by requiring that diesel construction equipment be fitted with diesel particulate filters.

TABLE 11
CUMULATIVE MITIGATED HEALTH RISK AND HAZARD IMPACTS AT MEISR

Cumulative Emission Source	Lifetime Excess Cancer Risk (in one million)	Chronic Hazard Index (Unitless ratio)	PM _{2.5} Concentration (ug/m ³)
Permitted stationary sources	35	0.01	0.05
Traffic on major roadways	3.5	<0.02	0.06
Ferry Terminal	30	0.01	0.1
Other construction sources	113	0.12	0.64
Total Non-Project Sources	182	0.15	0.85
BAAQMD Cumulative Thresholds	100	10	0.8
Project contribution	1.5	0.003	0.014
Cumulative total with Project	184	0.15	0.86
Project contribution as a percentage of cumulative	0.8%	2%	1.6%

* Includes the following four projects: 8 Washington Street/Seawall Lot 351, the 34th America's Cup; the James R. Herman Cruise Terminal; and the SFDPW pavement renovation

SOURCES: BAAQMD, 2011c; Environ, 2012

Because the proposed project would reduce its contribution of DPM through application of diesel particulate filters in accordance with **Mitigation Measure M-AQ-2**, the proposed project would not result in a cumulatively considerable contribution to lifetime excess cancer risk or PM_{2.5} emissions (*less than significant with mitigation*).

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less-Than- Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
8. GREENHOUSE GAS EMISSIONS— Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHGs has been implicated as the driving force in global climate change. The primary GHGs are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone, and water vapor.

Although the primary GHGs in the atmosphere are naturally occurring, CO₂, CH₄, and N₂O are largely emitted by human activities; these emissions are increasing the accumulation of these compounds within earth's atmosphere. CO₂ emissions are largely byproducts of fossil fuel combustion whereas methane results from offgassing associated with agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride and are generated in certain industrial processes. GHGs are typically reported in "carbon dioxide-equivalent" measures (CO₂E).¹⁹

There is international scientific consensus that human-caused increases in GHGs have contributed and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, snow pack loss, sea level rise, more extreme heat days per year, more

¹⁹ Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which are weighted averages based on each gas's heat absorption (or "global warming") potential.

high-ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts on agriculture, changes in disease vectors, and changes in habitat, and biodiversity.

The California Air Resources Board (CARB) estimated that in 2006 California produced about 484 million gross metric tons of CO₂E (MMTCO₂E), or about 535 million U.S. tons (CARB, 2010a). The CARB found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in state and out of state) at 22 percent, and industrial sources at 20 percent. Commercial and residential fuel use (primarily for heating) accounted for 9 percent of GHG emissions (CARB, 2010a). In the Bay Area, fossil fuel consumption in the transportation sector (onroad motor vehicles, offhighway mobile sources, and aircraft) and the industrial and commercial sectors are the two largest sources of GHG emissions, each accounting for approximately 36 percent of the Bay Area's 95.8 MMTCO₂E emitted in 2007 (BAAQMD, 2010a). Electricity generation accounts for approximately 16 percent of the Bay Area's GHG emissions, followed by residential fuel usage at 7 percent, offroad equipment at 3 percent and agriculture at 1 percent (BAAQMD, 2010a).

Regulatory Setting

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires the CARB to design and implement emission limits, regulations, and other feasible and cost-effective measures such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions).

Pursuant to AB 32, CARB adopted a scoping plan in December 2008 outlining measures to meet the 2020 GHG reduction limits. To meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels, or about 15 percent from today's levels (CARB, 2010b). The scoping plan estimates a reduction of 174 MMTCO₂E (about 191 million U.S. tons) from the transportation, energy, agriculture, forestry, and high global warming potential sectors (see **Table 12**). The CARB scoping plan also identifies an implementation timeline for the GHG reduction strategies (CARB, 2010c). Some measures may require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Additionally, some emissions reductions strategies may require their own environmental review under CEQA or the National Environmental Policy Act (NEPA).

TABLE 12
GHG REDUCTIONS FROM THE AB 32 SCOPING PLAN SECTORS

GHG Reduction Measures By Sector	GHG Reductions (MMT CO₂E)
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure (Discrete Early Action)	1.0
Forestry	5.0
High Global Warming Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Total	174.0
Other Recommended Measures	
Government Operations	1.0-2.0
Agriculture - Methane Capture at Large Dairies	1.0
Methane Capture at Large Dairies	1.0
Additional GHG Reduction Measures	
Water	4.8
Green Buildings	26.0
High Recycling/Zero Waste	
• Commercial Recycling	
• Composting	
• Anaerobic Digestion	9.0
• Extended Producer Responsibility	
• Environmentally Preferable Purchasing	
Total	42.8-43.8

SOURCE: CARB, 2010c

AB 32 also anticipates that local government actions will result in reduced GHG emissions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments themselves and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

The scoping plan relies on the requirements of Senate Bill 375 (SB 375) to implement the carbon emission reductions anticipated from land use decisions. SB 375 was enacted to align local land use and transportation planning to achieve the state's GHG reduction goals. SB 375 requires regional transportation plans, developed by Metropolitan Planning Organizations (MPOs), to incorporate a "sustainable communities strategy" in their regional transportation plans (RTPs) that would achieve GHG emission

reduction targets set by CARB. SB 375 also provides for streamlined CEQA review for some infill projects such as transit-oriented development. SB 375 would be implemented over the next several years, and the Metropolitan Transportation Commission's 2013 RTP would be its first plan subject to SB 375.

Senate Bill 97 (SB 97) required the Office of Planning and Research (OPR) to amend the state CEQA guidelines to address the feasible mitigation of GHG emissions or the effects of GHGs. In response, OPR amended the CEQA guidelines to provide guidance for analyzing GHG emissions. Among other changes to the CEQA guidelines, the amendments add a new section to the CEQA Checklist (CEQA Guidelines Appendix G) to address questions regarding a project's potential to emit GHGs.

The BAAQMD is the primary agency responsible for air quality regulation in the nine-county San Francisco Bay Area Air Basin (SFBAAB). As part of its role in air quality regulation, BAAQMD has prepared CEQA air quality guidelines to assist lead agencies in evaluating air quality impacts of projects and plans proposed in the SFBAAB. The guidelines provide procedures for evaluating potential air quality impacts during the environmental review process, consistent with CEQA requirements. On June 2, 2010, the BAAQMD adopted new and revised CEQA air quality thresholds of significance and issued revised guidelines that supersede the 1999 air quality guidelines. The *2010 CEQA Air Quality Guidelines* (BAAQMD, 2010b) provide CEQA thresholds of significance for GHG emissions. Although BAAQMD's adoption of the significance thresholds in 2010 and 2011 are the subject of recent judicial actions, the Planning Department has determined that Appendix D of the BAAQMD *CEQA Air Quality Guidelines*, in combination with BAAQMD's *Revised Draft Options and Justification Report*, provide substantial evidence to support the BAAQMD recommended thresholds and, therefore, has determined they are appropriate for use in this analysis. Thus, OPR's amendments to the CEQA Guidelines as well as BAAQMD's *2010 CEQA Air Quality Guidelines* and thresholds of significance have been incorporated into this analysis.

Individual projects contribute to the cumulative effects of climate change by directly or indirectly emitting GHGs during construction and operation. As noted above, the most common GHGs resulting from human activity are CO₂, CH₄, and N₂O (OPR, 2008). According to state law, GHGs also include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. These latter GHG compounds are usually emitted in industrial processes and are therefore not applicable to the proposed project. Once constructed, the proposed project would not result in an increase in emissions because there would no direct operational emissions from new vehicle trips or area sources (natural gas combustion) and no substantial change in indirect emissions from electrical use or energy required to pump, treat, and convey wastewater.

Impact GG-1: The proposed project would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. (Less than Significant)

The proposed project would result in an increase in GHG emissions primarily during the construction phase. Once the project is constructed, the SFPUC would be responsible for normal maintenance of the new force main, appurtenant structures, and mechanical systems to ensure proper operation, cleaning, and odor control. Similar to existing maintenance practices, three to four workers would access the vaults up to one day per year and would use portable pumps to dewater the vaults as needed. There would be negligible changes to the wastewater system operations upon completion of the project because the new North Shore to Channel Force Main would have about the same capacity as the existing main. Pump station operations would not change overall. However, there would be a minimal amount of additional energy required to operate the North Shore to Channel Force Main because it would be a longer pipeline and include more bends than the portion being bypassed, and would therefore experience more energy losses than the facility it would replace. The proposed water main relocation or replacement under the project would not increase overall water usage when compared to existing conditions. The project would not result in an increase in discarded landfill materials. Therefore, operation of the proposed project would not appreciably contribute to annual long-term increases in GHGs associated with increases in energy use, water use, wastewater treatment, or solid waste disposal.

As discussed above, the BAAQMD has adopted CEQA thresholds of significance for projects that emit GHGs, one of which is a determination of whether the proposed project is consistent with a Qualified Greenhouse Gas Reduction Strategy, as defined in the *2010 CEQA Air Quality Guidelines*. On August 12, 2010, the San Francisco Planning Department submitted a draft of the City and County of San Francisco's (CCSF's) *Strategies to Address Greenhouse Gas Emissions* to the BAAQMD (2010). The *Strategies to Address Greenhouse Gas Emissions* document presents a comprehensive assessment of policies, programs, and ordinances that collectively represent San Francisco's Qualified Greenhouse Gas Reduction Strategy in compliance with the BAAQMD's *2010 CEQA Air Quality Guidelines* and thresholds of significance.

San Francisco's GHG reduction strategy identifies a number of mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the energy efficiency of new and existing buildings, installing solar panels on building roofs, implementing a green building strategy, adopting a zero waste strategy, adopting a construction and demolition debris recovery ordinance, adopting a solar energy generation subsidy, incorporating alternative fuel vehicles in CCSF's transportation fleet (including buses and taxis), and adopting a mandatory composting

ordinance. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions.

San Francisco's climate change goals are identified in the 2008 Greenhouse Gas Reduction Ordinance as follows:

- By 2008, determine the city's 1990 GHG emissions, the baseline level to which target reductions are set
- Reduce GHG emissions by 25 percent below 1990 levels by 2017
- Reduce GHG emissions by 40 percent below 1990 levels by 2025
- Reduce GHG emissions by 80 percent below 1990 levels by 2050

CCSF's 2017 and 2025 GHG reduction goals are more aggressive than the state's GHG reduction goals as outlined in AB 32 and are consistent with the state's long-term (2050) GHG reduction goals. San Francisco's *Strategies to Address Greenhouse Gas Emissions* identifies CCSF's actions to pursue cleaner energy, energy conservation, alternative transportation, and solid waste policies, and concludes that San Francisco's policies have resulted in a reduction in GHG emissions below 1990 levels, meeting statewide AB 32 GHG reduction goals. As reported, San Francisco's 1990 GHG emissions were approximately 8.26 MMTCO₂E, and 2005 GHG emissions are estimated at 7.82 MMTCO₂E, representing an approximately 5.3 percent reduction in GHG emissions below 1990 levels.

The BAAQMD reviewed San Francisco's *Strategies to Address Greenhouse Gas Emissions* and concluded that the strategy meets the criteria for a Qualified GHG Reduction Strategy as outlined in BAAQMD's CEQA Guidelines (BAAQMD, 2010b) and stated that San Francisco's "aggressive GHG reduction targets and comprehensive strategies help the Bay Area move toward reaching the State's AB 32 goals, and also serve as a model from which other communities can learn" (Roggenkamp, 2010).

Based on the BAAQMD's 2010 *CEQA Air Quality Guidelines*, the Planning Department has determined that projects consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions* would result in a less-than-significant impact with respect to GHG emissions. Furthermore, because San Francisco's strategy is consistent with AB 32 goals, projects that are consistent with San Francisco's strategy would not conflict with the state's plan for reducing GHG emissions. As discussed in San Francisco's *Strategies to Address Greenhouse Gas Emissions*, new development and renovations/alterations for private projects and municipal projects are required to comply with San Francisco's ordinances that reduce GHG emissions. Table 13 shows applicable requirements for a municipal project and indicates whether or not the proposed project would be in compliance with applicable requirements.

TABLE 13
GREENHOUSE GAS ANALYSIS COMPLIANCE CHECKLIST FOR THE PROPOSED PROJECT

Regulation	Requirement	Project Compliance	Discussion
Transportation Sector			
Commuter Benefits Ordinance (Environment Code, Section 421)	All CCSF employees are offered commuter benefits for transit and vanpool expenses. The City Hall bike room provides secure bicycle parking and showers and lockers for bicycle commuters. CCSF employees are also eligible for telecommuting and alternative work schedules.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Emergency Ride Home Program	All CCSF employees are automatically eligible for the emergency ride home program.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Healthy Air and Smog Ordinance (Environment Code, Chapter 4)	Ordinance requires all new purchases or leases of passenger vehicles and light-duty trucks to be the cleanest and most efficient vehicles available on the market. There are also requirements for medium- and heavy-duty vehicles and for phasing out highly polluting vehicles (diesel Muni buses).	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Biodiesel for Municipal Fleets (Executive Directive 06-02)	Directive requires all CCSF departments that use diesel to begin using biodiesel (B20). Sets goals for all diesel equipment to be run on biodiesel by 2007 and goals for increasing biodiesel blends to B100.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Clean Construction Ordinance (Administrative Code, Section 6.25)	Effective March 2009, all contracts for large (20+ day) City projects are required to: <ul style="list-style-type: none"> Fuel diesel vehicles with B20 biodiesel Use construction equipment that meet USEPA Tier 2 standards or best available control technologies for equipment over 25 hp. 	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project would implement the Clean Construction Ordinance, see Section E.7, Air Quality.
Bicycle Parking in City-Owned and Leased Buildings (Planning Code, Section 155.1)	Class 1 and 2 Bicycle Parking Spaces Class 1 Requirements: (A) Provide two spaces in buildings with 1-20 employees. (B) Provide four spaces in buildings with 21 to 50 employees. (C) In buildings with 51 to 300 employees, provide bicycle parking equal to at least 5 percent of the number of employees at that building, but no fewer than five bicycle spaces.	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project does not involve the construction of a new building; therefore, this requirement does not apply.

TABLE 13 (Continued)
GREENHOUSE GAS ANALYSIS COMPLIANCE CHECKLIST FOR THE PROPOSED PROJECT

Regulation	Requirement	Project Compliance	Discussion
Transportation Sector (cont.)			
	<p>(D) In buildings with more than 300 employees, provide bicycle parking equal to at least 3 percent of the number of employees at that building, but no fewer than 16 bicycle spaces.</p> <p>In addition to the Class 1 bicycle parking spaces provide Class 2 bicycle parking.</p> <p>Class 2 Requirements:</p> <p>(A) In buildings with one to 40 employees, at least two bicycle parking spaces shall be provided.</p> <p>(B) In buildings with 41 to 50 employees, at least four bicycle parking spaces shall be provided.</p> <p>(C) In buildings with 51 to 100 employees, at least six bicycle parking spaces shall be provided.</p> <p>(D) In buildings with more than 100 employees, at least eight bicycle parking spaces shall be provided. Wherever a responsible CCSF official is required to provide eight or more Class 2 bicycle parking spaces, at least 50 percent of those parking spaces shall be covered.</p>		
Bicycle parking in parking garages (Planning Code, Section 155.2)	<p>(A) Every garage will supply a minimum of six bicycle parking spaces.</p> <p>(B) Garages with between 120 and 500 automobile spaces shall provide one bicycle space for every 20 automobile spaces.</p> <p>(C) Garages with more than 500 automobile spaces shall provide 25 bicycle spaces plus one additional space for every 40 automobile spaces over 500 spaces, up to a maximum of 50 bicycle parking spaces.</p>	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project does not involve the construction of a new garage; therefore, this requirement does not apply.
Transportation Management Programs (Planning Code, Section 163)	Code section requires new buildings or additions over a specified size (buildings >25,000 square feet (sf) or 100,000 sf depending on the use and zoning district) within certain zoning districts (including downtown and mixed-use districts in the city's eastern neighborhoods and south of market) to implement a Transportation Management Program and provide onsite transportation management brokerage services for the life of the building.	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project does not involve the construction of a new building or addition; therefore, this requirement does not apply.

TABLE 13 (Continued)
GREENHOUSE GAS ANALYSIS COMPLIANCE CHECKLIST FOR THE PROPOSED PROJECT

Regulation	Requirement	Project Compliance	Discussion
Energy Efficiency Sector			
Resource Efficiency and Green Building Ordinance (Environment Code, Chapter 7)	<p>Ordinance specifies requirements for all city buildings as well as requirements for construction and demolition debris recycling, and requirements for new construction. All new construction must comply achieve at a minimum the LEED® Silver standard. These buildings are required to perform commissioning to ensure achievement of design standards.</p> <p>All other buildings are required to meet the following minimum specifications related to energy efficiency:</p> <ol style="list-style-type: none"> 1. Toilets must use no more than 1.6 gallons/flush. 2. Showerheads must use no more than 1.5 gal/minute. 3. All lighting and electrical fixtures must meet specified requirements. 4. All fluorescent lamps must be replaced. 	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project does not involve the construction of a new building; therefore, this requirement does not apply.
Waste Reduction Sector			
Resource Efficiency and Green Building Ordinance (Environment Code, Chapter 7)	<p>Ordinance requires all demolition and new construction projects to prepare a Construction and Demolition Debris Management Plan designed to recycle construction and demolition materials to the maximum extent feasible, with a goal of 75% diversion.</p> <p>Ordinance requires all CCSF buildings to provide adequate recycling space</p>	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project includes preparation of a Construction and Demolition Debris Management Plan in compliance with San Francisco's Construction and Demolition Debris Recovery Program (Ordinance No. 27-06), see Section E.11, Utilities.
Resource Conservation Ordinance (Environment Code, Chapter 5)	Ordinance establishes a goal for each CCSF department to (i) maximize purchases of recycled products and (ii) divert from disposal as much solid waste as possible so that CCSF can meet the state-mandated 50% diversion requirement. Each CCSF department shall prepare a Waste Assessment. Ordinance also requires the Department of the Environment to prepare a Resource Conservation Plan that facilitates waste reduction and recycling. Ordinance requires janitorial contracts to consolidate recyclable materials for pickup. Lastly, ordinance specifies purchasing requirements for paper products.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Mandatory Recycling and Composting Ordinance (Environment Code, Chapter 19)	Mandatory recycling and composting ordinance requires all persons in San Francisco to separate their refuse into recyclables, compostables, and trash, and place each type of refuse in a separate container designated for disposal of that type of refuse.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.

TABLE 13 (Continued)
GREENHOUSE GAS ANALYSIS COMPLIANCE CHECKLIST FOR THE PROPOSED PROJECT

Regulation	Requirement	Project Compliance	Discussion
Waste Reduction Sector (cont.)			
Construction Recycled Content Ordinance (Administrative Code, Section 6.4)	Ordinance requires the use of recycled content material in public works projects to the maximum extent feasible and gives preference to local manufacturers and industry.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Environment/Conservation Sector			
Street Tree Planting Requirements for New Construction (Planning Code Section 143)	Planning Code Section 143 requires new construction and significant alterations or relocation of buildings within many of San Francisco's zoning districts to plant one 24-inch box tree for every 20 feet along the property street frontage.	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project does not involve the construction of a new building; therefore, this requirement does not apply.
Environmentally Preferable Purchasing Ordinance (Formerly Precautionary Purchasing Ordinance)	Requires CCSF departments to purchase products on the Approved Green Products List, maintained by the Department of the Environment. The items in the Approved Green Products List have been tested by CCSF departments and meet standards that are more rigorous than ecolabels in protecting our health and environment.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Tropical Hardwood and Virgin Redwood Ban (Environment Code, Chapter 8)	The ordinance prohibits CCSF departments from procuring or engaging in contracts that would use the ordinance-listed tropical hardwoods and virgin redwood.	<input checked="" type="checkbox"/> Project Complies <input type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project is a municipal project that would be required to comply with all CCSF ordinances.
Wood Burning Fireplace Ordinance (San Francisco Building Code, Chapter 31, Section 3102.8)	Ordinance bans installation of wood-burning fire places except for the following: <ul style="list-style-type: none"> • Pellet-fueled wood heater • U.S. EPA-approved wood heater • Wood heater approved by the Northern Sonoma Air Pollution Control District 	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project would not include the installation of fireplaces, wood burning or otherwise; therefore, this requirement does not apply.
Regulation of Diesel Backup Generators (San Francisco Health Code, Article 30)	Code requires: All diesel generators to be registered with the Department of Public Health All new diesel generators to be equipped with the best available air emissions control technology	<input type="checkbox"/> Project Complies <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Project Does Not Comply	The proposed project would not require a diesel backup generator; therefore, this requirement does not apply.

Depending on a proposed project's size, use, and location, a variety of controls are in place to ensure that the project would not impair the state's ability to meet statewide GHG reduction targets outlined in AB 32 or affect CCSF's ability to meet San Francisco's local GHG reduction targets. Projects that are consistent with San Francisco's regulations would not contribute significantly to global climate change because: (1) San Francisco has implemented regulations to reduce GHG emissions specific to new construction and renovations of private developments and municipal projects; (2) San Francisco's sustainable policies have resulted in the measured success in reducing GHG emissions levels; (3) San Francisco has met and exceeded AB 32 GHG reduction goals for the year 2020; (4) current and probable future state and local GHG reduction measures will continue to reduce projects' contributions to climate change; and (5) San Francisco's *Strategies to Address Greenhouse Gas Emissions* meet BAAQMD's requirements for a Qualified GHG Reduction Strategy. The proposed project would comply with these requirements and was therefore determined to be consistent with San Francisco's *Strategies to Address Greenhouse Gas Emissions*. Further, GHG emissions would primarily be associated with the construction phase of the project and would therefore be short term. Therefore, the proposed project would result in a *less than significant* impact with respect to GHG emissions.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
9. WIND AND SHADOW—Would the project:					
a) Alter wind in a manner that substantially affects public areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact WS-1: The proposed project would not alter wind in a matter that substantially affects public areas. (No Impact)

Wind impacts are generally caused by large building masses or other structures extending substantially above their surroundings. Because the proposed project would consist of replacement of an underground sewer pipeline and installation of two below ground vaults and would not include any buildings or other aboveground structures, the project would have *no impact* related to alteration of winds.

Impact WS-2: The proposed project would not create new shadow in a manner that could substantially affect outdoor recreation facilities or other public areas. (No Impact)

Section 295 of the *San Francisco Planning Code* was adopted in response to Proposition K (passed in November 1984) to protect certain public open spaces from shadowing by new structures during the periods 1 hour after sunrise and 1 hour before sunset, year round. The project would not affect properties protected by Proposition K and would not shade outdoor recreational facilities or other public areas because no aboveground structures would be built. Therefore, there would be *no impact* related to creation of new shadows.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
10. RECREATION—Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Physically degrade existing recreational resources?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact RE-1: The project would not increase the use of existing neighborhood parks and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated and would not result in physical degradation of recreational resources. (No Impact)

Recreational facilities in the project vicinity include:

- Golden Gateway Tennis and Swim Club, a private recreational facility that includes tennis courts and outdoor aquatic facilities, is generally located between The Embarcadero, Drumm Street, Broadway, and Washington Street. This facility overlies the portion of the new force main alignment within the former Jackson Street right-of-way.
- Sue Bierman Park is a public park with curved paths, park benches, and landscaping. It is frequented primarily by local residents and employees of local businesses. It extends on either side of Drumm Street between Washington and Clay Streets.

- Rincon Plaza and Spear Street Plaza are open plazas with bench seating and are commonly used by downtown workers during lunchtime hours. They are located on Spear Street between Mission and Howard Streets.
- Walton Park is a publicly accessible open space located approximately one block northwest of the project, adjacent to Jackson Street.
- In the vicinity of the project, bicycle routes are interconnected to the Citywide Bicycle Network and provide access between the project area and locations throughout CCSF. Bicycle Route No. 5 runs on The Embarcadero and is a Class II facility (on-street bicycle lanes). In addition, The Embarcadero is designated as part of the Bay, Ridge, and Coast Trails, recreational pedestrian/bicycle paths connecting several Bay Area cities.

Construction activities in the vicinity of the Golden Gateway Tennis and Swim Club would include trenchless construction beneath the tennis courts and open-cut excavation along Drumm Street, adjacent to the recreational facilities. Access and use of the club would be maintained at all times during construction. Construction might require the temporary relocation of an informal summer program drop-off location on the corner of Battery and Jackson Streets. Construction activities in the vicinity of Sue Bierman Park, Rincon Plaza, Spear Street Plaza, and Walton Park would not require closure of the parks, and these areas would not be used for staging. Although recreational bicyclists would be affected by temporary closure of the Class II bicycle lane on The Embarcadero, the bicyclists would share the southbound traffic lane with motor vehicles for approximately 200 feet through the construction area during the construction period, as discussed in Section E.5, Transportation and Circulation. Alternatively, bicyclists could use alternate routes, such as southbound Battery Street to the west. Further, the bicycle lane would be restored to full use when construction is complete.

Although use of recreation facilities in the vicinity of the project area would be maintained during construction, some recreationists who currently use these areas might not want to use them because of the level of construction activities. Some may choose to use other similar neighborhood parks, tennis courts, and bicycle routes instead, resulting in occasional increases in use of other recreational facilities. However, given the availability of recreation opportunities in the project vicinity and the length of the construction period (14 months), increased use of other recreational facilities would be minimal and would not result in substantial deterioration of recreational facilities.

The new force main would have a capacity of 35 mgd, about the same as the existing North Shore Force Main. As discussed in Section E.3, Population and Housing (Impact PH-1), the proposed project would not increase sewage transmission or treatment capacities, and as such, would not induce growth, directly or indirectly. In addition, operation of the new force main would be substantially the same as existing

conditions, and no new workers would be required to maintain the new force main. Therefore, the project would not increase the local population, so it would not increase the use of neighborhood and regional parks or other recreational facilities. The project would have *no impact* related to physical deterioration of recreational facilities from increased use.

Impact RE-2: The project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. (Not Applicable)

The proposed project does not include the construction of recreational facilities. In addition, as described in Impact RE-1, the project would not result in an increase in the local population and so would not require new or expanded recreational facilities to serve new recreation demands. Therefore, this impact is *not applicable* to the proposed project.

Impact RE-3: The project would not degrade existing recreational resources. (Less than Significant)

Construction activities in the vicinity of the Golden Gateway Tennis and Swim Club would be beneath the tennis courts, and the existing recreation facilities would not be directly affected by construction activities. Construction might require the relocation of an informal summer program drop-off location on the corner of Battery and Jackson Streets, but, following construction, the existing drop-off location could be used again. Construction activities adjacent to Sue Bierman Park, Rincon Plaza, and Spear Street Plaza include open-cut excavation and pipeline installation within Drumm and Spear Streets. Construction activities would not physically encroach on these recreational facilities, and these facilities would not be used for staging. Although the southbound Class II bicycle lane on The Embarcadero would be temporarily closed during construction bicyclists, would share the southbound traffic lane with motor vehicles for approximately 200 feet through the construction area during the construction period. Alternatively, they could use alternate routes, such as southbound Battery Street to the west. The bicycle lane would be restored at the completion of construction as discussed in Section E.5, Transportation and Circulation. On the basis of the above analysis, impacts related to the degradation of existing recreational resources would be *less than significant*.

Impact C-RE: The proposed project, in combination with other past, present, or reasonably foreseeable future projects, would not result in significant cumulative recreation impacts. (No Impact)

The potential for the project to affect recreational resources is limited to the project area and immediate vicinity where there could be adverse effects to existing recreational resources. Therefore, the geographic scope of cumulative impacts includes the project area and immediate vicinity.

As discussed in Impact RE-3, construction activities associated with the proposed project would include trenchless construction beneath the tennis courts of the Golden Gateway Tennis and Swim Club and open-cut excavation adjacent to Sue Bierman Park, Rincon Plaza, Spear Street Plaza, and near Walton Park but would not degrade these recreational facilities. The 8 Washington Street/Seawall Lot 351 project would replace the Golden Gateway Tennis and Swim Club with two mixed-use buildings (retail and residential) and outdoor health club facilities (tennis courts and pools) and is the only project listed in Table 3 that could affect recreational facilities in the proposed project vicinity. Recreational impacts specific to the 8 Washington Street/Seawall Lot 351 project would include the removal of five tennis courts and a basketball half court at the Golden Gateway Tennis and Swim Club, and an increase in the use of CCSF recreational facilities; however, there would be *no cumulative impact* related to recreational resources because the proposed project would not degrade any recreational facilities or increase use of other recreational facilities in the CCSF.

<u>Topics:</u>	<u>Potentially Significant Impact</u>	<u>Less Than Significant with Mitigation Incorporated</u>	<u>Less-Than- Significant Impact</u>	<u>No Impact</u>	<u>Not Applicable</u>
11. UTILITIES AND SERVICE SYSTEMS—					
Would the project:					
a) Disrupt operation or require relocation of regional or local utilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
e) Have sufficient water supply available to serve the project from existing entitlements and resources, or require new or expanded water supply resources or entitlements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Result in a determination by the wastewater treatment provider that would serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact UT-1: Project construction would not result in a substantial adverse effect related to disruption of utility operations or accidental damage to existing utilities. (Less than Significant)

As described in Section B, Project Description, some underground utility lines located along the North Shore to Channel Force Main alignment would be relocated prior to installing the new force main. Two existing water mains on Spear Street and along the North Shore to Channel Force Main alignment, are located along the new force main alignment, and these water mains would be relocated or replaced as part of the project, resulting in temporary service disruption of 2 to 3 hours. Construction activities for the proposed project could also damage or interfere with other existing water, sewer, storm drain, natural gas, electricity, and/or communication lines and, in some cases, could require that existing lines be relocated, potentially causing service interruptions.

SFPUC is subject to San Francisco Public Works Code requirements pertaining to work in the public right of way (CCSF Public Works Code Article 2.4) and related regulations. Among other requirements, SFPUC procedures require anyone doing work in the street to notify all governmental and private utilities of the intent to construct underground utilities and then to coordinate with those utilities to avoid conflicts, relocate utilities if needed and assure no interruption of service. SFPUC will comply with all SFPUC procedures pertaining to work in the streets.

Water Mains

The SFPUC contractor would replace an 8-inch-diameter water main along Drumm Street between Jackson and Clay Streets (see Figure 2); this work would likely occur after the proposed new force main is installed. The 12-inch-diameter water main along Spear Street between Market and Mission Streets and the 8-inch-diameter water main along Spear Street between Mission and Howard Streets (see Figure 2) would be relocated to the opposite side of the street prior to the new force main construction to make room for the new force main. When the water mains are relocated and replaced, there would be a 2- to 3-hour interruption in water service to put the new water lines in service. However, as described in Section B, Project Description, the service disruption would be temporary, and the SFPUC would provide advance notices and coordinate with residents and businesses along the project alignment of the date and time of the temporary service interruption. Therefore, impacts related to water service disruption would be *less than significant*.

Other Utilities

A number of known utility lines cross the new force main alignment, including underground PG&E electricity and gas lines, SFPUC Auxiliary Water Supply System (AWSS) pipelines, SFPUC sewer lines, telephone lines, and telecommunication lines. There are also overhead electric lights along the alignment, overhead electric Muni cable lines along Spear and Market Streets, and the Embarcadero BART station and tunnel beneath the Market Street pedestrian plaza.

Identified privately owned underground utilities along the new force main alignment would be relocated prior to project construction. In addition, the contractor would be required to either support in place, remove and replace, or temporarily relocate utilities that cross the proposed alignment. Current contract specifications include the following plans for management of potentially affected utilities:

- Prior to construction activities, the SFPUC or its contractor(s) shall determine the locations of overhead and underground utility lines, such as natural gas, electricity, sewer, telephone, fuel, and water lines, that might be encountered during excavation work. Pursuant to state law, the SFPUC or its contractor(s) shall notify Underground Service Alert of Northern California and Nevada (USA North) so that utility companies may be advised of the work and may field-mark or otherwise protect and warn the contractor of their existing utility lines. Information regarding the exact location of existing utilities shall be confirmed before construction activities begin. Utilities may be located by customary techniques such as geophysical methods and hand excavation.
- The SFPUC or its contractor(s) shall notify all affected utility service providers sufficiently in advance of the project construction plans and schedule. The SFPUC or its contractor(s) shall

make arrangements with these entities regarding the protection, relocation, or temporary disconnection of services prior to the start of construction, and shall promptly reconnect services, as required.

- If feasible, the contractor shall avoid disruption to existing side-sewers and culverts by supporting the lines with cables and beams while performing excavation over or under the lines. If it is not feasible to avoid the lines, the contractor would remove and replace, or relocate the side sewers or culverts that interfere with the new force main alignment, in accordance with SFPUC standard procedures.
- If feasible, the contractor shall avoid disruption to existing underground SFPUC AWSS water lines by supporting the lines with cables and beams while performing excavation over or under the lines. If it is not feasible to avoid the water lines, the construction contractor would need to cut the lines and either temporarily or permanently relocate them in coordination with SFPUC.
- Detailed procedures shall be included in the design plans for excavation, support, and fill of areas around subsurface utilities, cables, and pipes. If it is not feasible to avoid or support below ground utility lines (i.e., side sewers), the SFPUC or its contractor(s) shall coordinate with the affected utility owners to either remove and replace or relocate underground utilities that interfere with the North Shore to Channel Force Main. To the extent feasible and in coordination with PG&E, the contractor would support, work around, and protect underground PG&E electric and gas facilities that are within the open-cut trenches along the project alignment.
- Two to four days in advance of construction, the SFPUC or its contractor(s) shall coordinate with the appropriate utility service providers to ensure advance notification of residents, owners, and businesses in the North Shore to Channel Force Main project area of a potential utility service disruption. The notification shall provide information about the timing and duration of the potential service disruption.
- To the extent feasible and in coordination with any affected private communication utilities (i.e., AT&T, Verizon/MCI, Xfinity/Comcast and Level 3), the contractor would support, work around, and protect underground communication facilities that are within the open-cut trenches along the project alignment.
- If the project encounters overhead electric Muni lines, the contractor would coordinate with the SFMTA to de-energize overhead electric lines as required by the federal and state OSHA regulations and reroute any affected bus lines.
- The contractor would coordinate with the SFPUC/Power Enterprise/Street Lighting Department to address and minimize any potential disruption to street lighting.
- The SFPUC or its contractor(s) shall develop an emergency response plan prior to commencing construction activities. The plan shall identify measures to be taken in response to a leak or explosion resulting from a utility rupture. In addition, the SFPUC or its contractor(s) shall notify local fire departments any time damage to a gas utility results in a leak or suspected leak, or whenever damage to any utility results in a threat to public safety (SFPUC, 2011a).

If utilities identified above are not protected, they could be damaged, resulting in safety hazards and/or disruption of service. However, compliance with S.F. Public Works Code Article 2.4 and related regulations, and implementation of the construction contract specifications reflecting these requirements would minimize any risk to utilities such that a less than significant impact is anticipated.

Impact UT-2: Implementation of the proposed project would not exceed wastewater treatment requirements, exceed the capacity of the wastewater treatment provider serving the project, or result in the construction of new wastewater treatment facilities. (No Impact)

The project area is served by San Francisco's combined sewer system, which collects and transports both sewage and stormwater runoff. The SEWPCP treats wastewater and stormwater from the east side of the city, including stormwater from the project area and wastewater that would be carried by the North Shore to Channel Force Main. The new force main would have about the same capacity as the existing North Shore Force Main; therefore, wastewater and stormwater carried in the new force main would not exceed the capacity of the SEWPCP. The proposed project would not increase the volume of stormwater runoff to the combined sewer system because the project area is completely covered with impervious surfaces and would be restored to existing conditions upon completion of construction with no change in impervious surfaces or related stormwater runoff volumes. Therefore, the proposed project would have *no impact* related to increased demand for wastewater or stormwater treatment or the need for new wastewater treatment facilities.

Impact UT-3: Implementation of the proposed project would not require new water provision facilities or new water entitlements to serve the project. (No Impact)

The proposed project would not include the construction of new facilities that would use water; therefore, no new water provision facilities or water entitlements would be required, and there would be *no impact* to water supply or water entitlements.

Impact UT-4: The proposed project would not require new stormwater drainage facilities, the construction of which could result in significant environmental effects. (No Impact)

The proposed project would not increase the volume of stormwater runoff to the combined sewer system because the project area is completely covered with impervious surfaces and would be restored to existing conditions upon construction completion with no change in impervious surface area or related

stormwater runoff volumes. Therefore, there would be *no impact* related to the need for new stormwater drainage facilities.

Impact UT-5: The proposed project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. (Less than Significant)

As described in Section B, Project Description, the North Shore to Channel Force Main Project would generate a total of approximately 11,000 cubic yards of spoils, consisting of excess soil, manholes, shoring material, and other structures from the excavation work. All 11,000 cubic yards of the spoils would be hauled off site.

San Francisco's solid waste is disposed of at the Altamont Landfill in Alameda County, which is required to meet federal, state, and local regulations for disposal of non-hazardous waste. However, the volume of solid waste that CCSF can dispose of at Altamont Landfill is governed by CCSF's agreement with the landfill operator. CCSF anticipates reaching its current limit between 2013 and 2015. On July 26, 2011, the Board of Supervisors adopted Resolution No. 322-11, which designates the Ostrom Road Landfill (Yuba County) as the future disposal site for all solid waste collected in the city until 2025, or until 5 million tons have been disposed of at that landfill. The total permitted capacity of the Ostrom Road Landfill is approximately 41 million cubic yards, and the estimated closure date for the landfill is 2066 (Recology, 2012).

The amount of construction waste, excluding excess soil, that would be disposed of under the proposed project represents less than 0.002 percent of the amount of CCSF waste that could be disposed of at the Ostrom Road Landfill before 2025. Further, as described in Impact UT-6, below, a minimum of 65 percent of the waste would be diverted from landfills in accordance with San Francisco's Construction and Demolition Debris Recovery Program (Ordinance No. 27-06).

As described in Section E.16, Hazards and Hazardous Materials, excavated soil that is classified as a hazardous waste would also be disposed of in a Class I permitted landfill in accordance with applicable laws and regulations for the disposal of hazardous waste, and the remaining soil would be disposed of at the Altamont Landfill Class II disposal facility. The remaining capacity of this facility is 5 million tons, and a new 40 million ton facility will be online in 2014 or 2015 (Altamont Landfill, 2012). The total volume of soil requiring disposal is approximately 0.2 percent of the remaining capacity of the existing Class II facility at Altamont Landfill. Thus, impacts related to exceeding permitted landfill capacity would be *less than significant*.

Once construction of the North Shore to Channel Force Main project is complete, the project would not generate wastes requiring disposal at a landfill; therefore, there would be *no impact* related to landfill capacity during operation.

Impact UT-6: Construction of the proposed project would follow all applicable statutes and regulations related to solid waste. (Less than Significant)

The California Integrated Waste Management Act of 1989 (Assembly Bill [AB] 939) requires municipalities to adopt an Integrated Waste Management Plan to establish objectives, policies, and programs relative to waste disposal, management, source reduction, and recycling. Pursuant to this act, San Francisco's Construction and Demolition Debris Recovery Program (Ordinance No. 27-06) requires a minimum of 65 percent of all construction and demolition debris (including soil, concrete, brick, and other materials) to be recycled and diverted from landfills. As described in Section B, Project Description, SFPUC's contractor would prepare and submit a construction and demolition debris management plan for the proposed project; the plan would require that all non-hazardous waste be taken to a registered facility. The SFPUC would also arrange for proper recycling, reuse, and disposal of construction and demolition materials (primarily waste asphalt) generated by the project. With implementation of this plan, impacts related to compliance with federal, state, and local solid waste statutes and regulations would be *less than significant*. Soil requiring disposal at a Class II or Class I disposal facility would be considered a hazardous or designated waste and would not be subject to these solid waste diversion goals.

Once construction of the North Shore to Channel Force Main project is complete, the project would not generate solid waste; therefore, there would be *no impact* related to compliance with federal, state, and local solid waste statutes and regulations during project operation.

Impact C-UT: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not result in a significant cumulative impact on utilities and service systems. (Less than Significant)

The geographic scope for potential cumulative utilities and service systems impacts consists of the project area, immediate vicinity, and the service areas of regional service/utility providers. For landfill capacity, the geographic scope includes the service areas of Alameda County where disposal of construction-related waste could occur. For compliance with solid waste statutes and regulations, the geographic area encompasses CCSF where the project would be constructed.

Damage to or Disruption of Existing Utilities and Relocation of Utilities

As described in Impact UT-1, the proposed project could damage or interfere with existing water, sewer, storm drain, natural gas, electricity, and/or communication lines and, in some cases, could require that existing lines be relocated, potentially causing service interruptions. Several of the projects listed in Table 3 could also result in damage to existing utilities, disruption of utility services, or relocation of utilities. In particular, the 8 Washington/Seawall Lot 351 project would overlap with the North Shore to Channel Force Main Project and could require relocation and/or disruption of the same utilities. However, the proposed project and all projects listed in Table 3 would be subject to CCSF Public Works Code Article 2.4 and related regulations, which requires a SFDPW permit for work in the public right-of-way prior to construction, and would address potential utility conflict or service disruption issues. Compliance with permit requirements would minimize the potential for damage to existing utilities or disruption of utility services, resulting in a *less than significant* cumulative impact.

Landfill Capacity

As discussed in Impact UT-5, the proposed project would generate an estimated 11,000 cubic yards of spoil. Most of the cumulative projects listed in Table 3 would also generate construction-related waste. If all of these wastes were disposed of in off-site disposal facilities, there could be a significant cumulative impact on landfill capacity. However, as discussed in Impact UT-5, construction waste from this project that would be disposed of off-site, excluding excess soil, represents less than 0.002 percent of the amount of CCSF waste that could be disposed of at the Ostrom Road Landfill before 2025. The total amount of soil requiring disposal is approximately 0.2 percent of the remaining capacity of the existing Class II facility at Altamont Landfill. Therefore, the project's contribution to cumulative demand on landfill capacity would not be cumulatively considerable (*less than significant*).

Compliance with Solid Waste Statutes and Regulations

The North Shore to Channel Force Main project and all of the projects listed in Table 3 would generate wastes that require off-site disposal. However, the proposed project would divert at least 65 percent of the non-hazardous construction waste from off-site disposal facilities (in excess of the state-mandated goal of 50 percent), and each of the cumulative projects would be required to implement source reduction, recycling, and composting measures — as mandated by AB 939 and implemented by San Francisco's Construction and Demolition Debris Recovery Program (Ordinance No. 27-06) — to

divert wastes from landfills. Therefore, the potential cumulative impact related to compliance with solid waste statutes and regulations would be *less than significant*.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
12. PUBLIC SERVICES —Would the project:					
a) Result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any public services such as fire protection, police protection, schools, parks, or other services?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact PS-1: The proposed project would not increase demand for police protection and fire protection such that new or physically altered governmental facilities would be required or acceptable service ratios, response times, or other performance objectives would be affected. (No Impact)

The project site currently receives emergency services from the San Francisco Fire Department (SFFD), and the San Francisco Police Department (SFPD). The new force main would have a capacity of 35 mgd, about the same as the existing North Shore Force Main. As discussed in Section E.3, Population and Housing (Impact PH-1), the proposed project would not increase sewage transmission or treatment capacities, and as such, the project would not result in an increase in the local population. Further, operation of the new force main would be substantially the same as existing conditions, and no new workers would be required to maintain the pipeline. Therefore, there would not be an increase in local population or a resulting increase in the need for new or physically altered governmental facilities. Further, the proposed project would not result in an increase in service calls to either the SFPD or the SFFD or the need for crime prevention activities or policing of the project area. Therefore, construction of the project would not necessitate additional fire protection or police protection facilities, and there would be *no impact* related to the provision of these facilities.

Impact PS-2: The proposed project would not increase the population of school-aged children and would not require new or physically altered school or park facilities. (No Impact)

The San Francisco Unified School District provides school services to the project area. As discussed above in Section E.3, Population and Housing, the project would not result in an increase in the local population; therefore, the population of school-age children would not increase. The project would not require new or physically altered schools. As discussed in Impact RE-2, the project would not include new or expanded recreational facilities (including parks). Therefore, the proposed project would have *no impact* related to the need for new or physically altered school or park facilities.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
13. BIOLOGICAL RESOURCES—					
Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact BI-1: The proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any special-status species (No Impact)

Review of the California Natural Diversity Database (CNDDDB) (California Department of Fish and Game [CDFG], 2012), the U.S. Fish and Wildlife Service Endangered Species List (U.S. Fish and Wildlife Service [USFWS], 2012), and the California Native Plant Society Inventory of Rare and Endangered Plants (California Native Plant Society [CNPS], 2012) identified 75 special-status animal and plant species²⁰ in the vicinity of the project area. However, the entirety of the project site is within existing streets in the financial district and south of Market areas of San Francisco, and all open-trench and trenchless construction would take place in or beneath paved city streets or a paved tennis court and parking lot. Historically, urban development has dominated these areas of San Francisco, including the project area, and the vast majority of native habitat has been removed. There is landscaped vegetation, including non-native trees (such as London plane tree (*Platanus x acerfolia*), Brazilian pepper tree (*Schinus terebinthifolius*), Canary Island palm (*Phoenix canariensis*), and poplar (*Populus* sp.)), ornamental plants, and turfgrass, present along streets and in the median of Drumm Street within the project area as well as within Sue Bierman Park, Walton Park, and Spear Street Plaza. Although birds and mammals habituated to urban disturbance are capable of occupying the habitats that this vegetation provides, these urban patches of landscaped vegetation cannot support any special-status wildlife species potentially occurring in San Francisco. Additionally, most recorded observations of special-status wildlife species in the vicinity of the project area are historical, and the species are currently considered extirpated (extinct in the project area) or potentially extirpated. Therefore, there is no potential for special-status species to be found within the project site, and project implementation would have *no impact* on candidate, sensitive, or special-status species directly or through habitat modification.

Native breeding birds protected by the CDFG Code or the Migratory Bird Treaty Act (MBTA) could nest in street trees. Impact BI-4 addresses impacts to native nesting birds.

²⁰ The term “special-status” species includes species that are listed and receive specific protection defined in federal or state endangered species legislation, as well as species not formally listed as “threatened” or “endangered” but designated as “rare” or “sensitive” on the basis of adopted policies and expertise of state resource agencies or organizations, or local agencies such as counties, cities, and special districts. A principal source for this designation is the California “Special Animals List” (CDFG, 2011).

Impact BI-2: The proposed project would not adversely affect riparian habitat or other sensitive natural communities. (No Impact)

Although some parts of San Francisco support riparian habitat and several sensitive natural plant communities, none of these features are present within the project area. As described in Impact BI-1, the project area and immediate surroundings are composed solely of hardscape and landscape vegetation, and no native vegetation is present. Therefore, there would be *no impact* to sensitive natural communities.

Impact BI-3: The proposed project would not adversely affect federally protected wetlands. (Less than Significant)

As described in Impact BI-1, the project area and immediate surroundings are composed solely of hardscape and landscape vegetation, and no federally protected wetlands are present. Open waters of San Francisco Bay are under federal jurisdiction and are located less than 0.25 mile east of the project area. However, stormwater runoff from the project area does not directly enter San Francisco Bay; this runoff is discharged to the SFPUC's combined sewer system and is treated at the SEWPCP or other wet-weather facilities before being discharged to the bay. Construction-related discharges to the combined sewer system would be subject to the requirements of Article 4.1 of the San Francisco Public Works Code (supplemented by SFDPW Order No. 158170), which incorporates and implements the SFPUC's NPDES permit and the federal CSO Control Policy for discharges from the combined sewer system. To ensure compliance with Article 4.1, the construction contractor would be required to develop and implement an erosion and sediment control plan for construction-related runoff and a dewatering plan for groundwater dewatering discharges, which would be subject to review and approval by the SFPUC (see Section E.15, Hydrology and Water Quality). Therefore, impacts on waters of San Francisco Bay, which are under federal jurisdiction, would be *less than significant*.

Impact BI-4: The proposed project could interfere with the movement of native resident or wildlife species, established native resident or migratory wildlife corridors, or native wildlife nursery sites. (Less than Significant with Mitigation)

Most native, breeding birds are protected under Section 3503 of the CDFG Code, and raptors (including peregrine falcons) are protected under Section 3503.5 of the CDFG Code. In addition, both Section 3513 of the CDFG Code and the MBTA (16 U.S. Code, Sec. 703 Supp. I, 1989) prohibit the killing, possession, or trading of migratory birds. Fish and Game Code Section 3511 allows the designation of a bird species as "fully protected"; this is a greater level of protection than is afforded by California Endangered Species Act because the "fully protected" designation means the listed species cannot be taken at any time. The only species

present in the vicinity of the project site that has been designated as fully protected is the American peregrine falcon (*Falco peregrinus*). Finally, Section 3800 of the CDFG Code prohibits the taking of non-game birds, which are defined as birds occurring naturally in California that are neither game birds nor fully protected species. Impacts on these protected species would be significant if tree removal disturbed nesting birds.

The San Francisco Breeding Bird Atlas (SFFO, 2003) synthesizes extensive records of avian breeding on the San Francisco Peninsula and shows a diverse assemblage of bird species breeding in San Francisco despite urbanized conditions in most areas. Native species that have been recorded in the area that the atlas describes as "Downtown San Francisco" and that have the potential to be found in the vicinity of the project area include: house finch (*Carpodacus mexicanus*), brown-headed cowbird (*Molothrus ater*), Brewer's blackbird (*Euphagus cyanocephalus*), dark-eyed junco (*Junco hyemalis*), white-crowned sparrow (*Zonotrichia leucophrys*), song sparrow (*Melospiza melodia*), American robin (*Turdus migratorius*), common raven (*Corvus corax*), American crow (*Corvus brachyrhynchos*), Anna's hummingbird (*Calypte anna*), and mourning dove (*Zenaida macroura*). All of these species are capable of habituating to disturbance levels typical of an urban area and are protected by Section 3008 of the CDFG Code and the MBTA.

Street trees along the project alignment have the potential to support native nesting birds protected under Section 3008 of the CDFG Code or the MBTA. Although the majority of these trees would not be directly affected during project construction, one Brazilian pepper tree and one London plane tree would be removed during project construction. Removal of these trees during nesting bird season (February 1 through August 31) could result in nest destruction or injury or mortality of nestlings, which would be considered a significant impact. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-BI-4, Protection of Active Nests**, which requires the SFPUC to net the trees to be removed prior to the nesting season to prevent nesting. If the netting is not in place prior to the nesting season, the SFPUC would be required to conduct surveys prior to tree removal to ensure that there are no active nests in the trees, and, in the event that active nests are identified, to delay removal of the trees until young have fledged or the nests are otherwise abandoned.

Breeding peregrine falcons have been recorded in San Francisco, notably on the roof of the PG&E building at 77 Beale Street, more than 500 feet southwest of the project site. Considering the height of this nest, the distance between the project alignment and the PG&E building, and existing noise levels of San Francisco city streets, construction activities and associated noise would not affect peregrine falcon nesting behavior at this nest.

Mitigation Measure M-BI-4: Protection of Active Nests.

To prevent nesting, the SFPUC shall, prior to the bird nesting season (February 1 through August 31), install netting on trees that are to be removed during construction.

If the netting is not in place prior to the nesting season, a qualified biologist shall be retained to survey the trees to be removed to verify the presence or absence of nesting birds no more than 14 days prior to tree removal. If active nests are observed, the trees shall not be removed until young have fledged or the nest is otherwise abandoned.

If tree removal is scheduled outside of the nesting season, no surveys or tree netting shall be required.

Impact BI-5: Implementation of the proposed project would not conflict with local policies or ordinances protecting biological resources, including a tree preservation policy or ordinance. (Less than Significant)

With the exception of street trees, no biological resources would be affected by the proposed project, and there are no landmark or significant trees within or adjacent to the project area.

CCSF's Urban Forestry Ordinance protects any street tree within the public right-of-way. Removed trees must be replaced with comparable trees. Work that takes place within the dripline of street trees that would be retained also requires protective measures to prevent impacts on retained trees.

The proposed project includes the removal of two street trees: one Brazilian pepper tree, located at the intersection of Jackson Street and Drumm Street, and one London plane tree located in the Market Street pedestrian plaza. Excavation activities would be conducted adjacent to street trees in many areas of the new force main alignment. As described in Section B, Project Description, the SFPUC would comply with the requirements of the ordinance by replacing the Brazilian pepper tree and the London plane tree and protecting the street trees to remain in place. SFPUC would comply with the following ordinance requirements as applicable:

- Submission of a Tree Disclosure Statement to the Planning Department, including the diameter measurement of both the trunks and canopy diameters of all trees potentially impacted by the project
- Submittal of site plans that accurately show the locations of all trees to be retained and all trees to be removed
- Replacement of any removed street trees with trees equivalent in replacement value, or payment of an in-lieu fee to the SFPUC Bureau of Urban Forestry
- Preparation of a Tree Protection Plan for retained trees, which includes, but is not limited to:

- Site plan with tree species, trunk location, trunk diameter at breast height, and canopy dripline area within development
- Protective fencing establishing an area to be left undisturbed during construction
- Protection specifications, including construction specifications such as: boring instead of trenching for utility lines, or tree care specifications such as drainage, fertilization, or irrigation measures
- Pruning specifications if needed to preserve the health of the tree and allow construction to proceed

The project also includes the installation of a tree on The Embarcadero that SFPUC previously removed. The removed trees and replacement tree (see Section B, Project Description) would be replaced in accordance with the Urban Forestry Ordinance. Compliance with the ordinance is considered part of the project; thus the project would not conflict with any policies in the ordinance designed to protect trees. Therefore, impacts related to conflicts with local policies or ordinances protecting biological resources would be *less than significant*.

Impact BI-6: The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. (No Impact)

No habitat conservation plans, natural community conservation plans, or other approved conservation plans apply to the project area. Therefore, the project would have *no impact* on any approved habitat conservation plans.

Impact C-BI: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity of the project area, would not result in significant cumulative impacts on biological resources. (Less than Significant)

Impacts on biological resources resulting from the proposed project would be limited to potential impacts on San Francisco Bay, adverse effects on street trees protected by San Francisco's Urban Forestry Ordinance, and disturbance of nesting birds. Therefore, the geographic scope of potential cumulative impacts on biological resources encompasses the waters of San Francisco Bay, which are under federal jurisdiction, and CCSF, which protects street trees under the San Francisco Urban Forestry Ordinance as well as birds that would nest in these trees.

Effects on Waters Under Federal Jurisdiction

As discussed in Impact BI-3, stormwater runoff and groundwater discharges resulting from the North Shore to Channel Force Main Project could adversely affect water quality in the waters of San Francisco Bay, which are under federal jurisdiction. However, these discharges would flow to the combined sewer system and would be subject to the requirements of Article 4.1 of the San Francisco Public Works Code (supplemented by SFDPW Order No. 158170), which incorporates and implements the SFPUC's NPDES permit and the federal CSO Control Policy for discharges from the combined sewer system. Because projects listed in Table 3 that would also include discharges to the combined sewer system would be subject to the same regulatory requirements, and compliance with the SFPUC's NPDES permit would ensure compliance with water quality objectives, cumulative impacts on the waters of San Francisco Bay that are under federal jurisdiction would be *less than significant*.

Effects on Wildlife Nursery Sites

As discussed in Impact BI-4, removal of two street trees during construction of the North Shore to Channel Force Main Project could adversely affect nesting birds if the trees were removed during the nesting season. Many of the projects listed in Table 3 could also adversely affect nesting birds as a result of tree removal or other construction-related activities, resulting in a potentially significant cumulative impact related to effects on native wildlife nursery sites. The North Shore to Channel Force Main Project's contribution to this cumulative impact would be cumulatively considerable. However, the North Shore to Channel Force Main Project's impacts would be less than significant with implementation of Mitigation Measure M-BI-3, Protection of Active Nests. This mitigation measure addresses impacts on nesting birds by requiring netting of trees prior to the nesting season to prevent nesting or surveys to determine the absence or presence of nests if netting is not in place prior to the nesting season and tree removal is conducted during the nesting season. With implementation of this mitigation measure, the project's residual contribution to cumulative impacts related to effects on wildlife nursery sites would not be cumulatively considerable (*less than significant*).

Conflicts with Local Policies or Ordinances Protecting Biological Resources

As discussed in Impact BI-5, two trees protected by San Francisco's Urban Forestry Ordinance would be removed during construction of the North Shore to Channel Force Main Project. Many of the projects listed in Table 3 could also include removal of protected trees. However, cumulative impacts related to conflicts with local policies or ordinances protecting biological resources would be less than significant

because the proposed project and all of the potentially cumulative projects would be required to comply with the Urban Forestry Ordinance, which requires replacement of the removed trees.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
14. GEOLOGY AND SOILS—					
Would the project:					
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Change substantially the topography or any unique geologic or physical features of the site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Project Area History and Geology

The project area is located within what was once Yerba Buena Cove, on the edge of San Francisco Bay (Treadwell & Rollo, 2010). In the 1800s, the cove was used as a shipping harbor with wharves to service

visiting ships. Beginning about 1851, the City began filling the cove, pushing the shoreline eastward in several steps. At each step, the new area created by seawalls was filled with materials obtained from the sand dunes between First and Valencia Streets as well as debris, large quantities of wood, and some ship hulls. In 1852, the filled area had reached the intersection of Market and Beale Streets; by 1856, the fill had reached the intersection of Market and California Streets near what is now the Market Street pedestrian plaza. Filling was completed to the full extent of the existing Embarcadero Seawall by about 1870.

The Drumm Street segment of the new force main alignment overlies the locations of approximately seven old Yerba Buena Cove wharves. The exact depths, dimensions, and conditions of the old wharves are unknown, but it is likely that they were supported on timber piles and at least some of the piles remain. The wharves were gradually abandoned and buried between 1850 and 1900. There are no known records describing how the wharves were demolished or whether they were buried in place.

With regard to geologic units and soils in the project area, the project site is located within the prehistoric Yerba Buena Canyon. This canyon was formed by erosion of sandstone and shale bedrock of the Franciscan Assemblage during the glacial period of the Pleistocene Epoch²¹ when sea level dropped to 300 feet below its current elevation. As the glacial activity ended, and the sea level rose, the canyon was progressively filled with alternating marine, alluvial, and windblown deposits. The marine deposits are bluish-gray to black and consist of fine sediments such as clay and silt, with some thin discontinuous lenses of sand. The freshwater and wind-blown deposits generally range from grayish brown to yellowish brown and consist of fine to medium sands with varying concentrations of clay, silt, and gravel. The most recently deposited natural soil (underlying the fill) is soft, highly organic marine clays, silts, and sands, collectively known as Bay Mud.

The project area is relatively level, with elevations ranging from approximately 1 foot to -1 foot City Datum.²² Existing boring information shows that the project area is underlain by approximately 10 to 30 feet of fill consisting of loose to medium dense sand to silty sand mixed with gravel, rubble, concrete, brick, glass, and wood. A layer of soft, compressible Bay Mud 40 to 85 feet thick underlies the fill. Within the project area, the bottom of the Bay Mud corresponds to elevations between about -65 to -113 feet City

²¹ The Pleistocene Epoch is a geologic time period dating from approximately 2 million to 11 thousand years ago when the northern hemisphere was heavily glaciated.

²² San Francisco City Datum establishes CCSF's zero point for surveying purposes at approximately 8.6 feet above the mean sea level established by 1929 U.S. Geological Survey datum, and approximately 11.3 feet above the current 1988 North American Vertical Datum. Because tides are measured from mean lower low water, which is about 3.1 feet below mean sea level (MSL), an elevation of 0 City Datum is approximately 8.2 feet above MSL.

Datum. In some areas, past dumping of overlying fill created large waves in the Bay Mud and thus an irregular surface at the top of the mud.

Beneath the Bay Mud is a layer of clay and silt of varying sand content, commonly called Old Bay Clay. The Old Bay Clay has been preconsolidated in excess of its present overburden pressure²³ and ranges from 20 to 170 feet thick. The Old Bay Clay is underlain by weathered sandstone, shale, and altered volcanic rocks (such as greenstone) of the Franciscan Assemblage.

Previous investigations indicate that groundwater is present at approximately 10 to 13 feet below ground surface, which corresponds to elevations of -10 to -13 feet City Datum. However, because of seasonal fluctuations and tides, the groundwater level can be as high as -5 feet City Datum (3 feet above sea level).

Impact GE-1: The proposed project would not result in exposure of people and structures to potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, seismic ground shaking, seismic ground failure (liquefaction, lateral spreading), or earthquake-induced landslides. (Less than Significant)

Fault Rupture

The nearest faults are the San Andreas fault, located 8 miles west of the project area, and the Hayward fault, located 9 miles east (Treadwell & Rollo, 2010). No active or potentially active faults cross the project area or are located in the immediate vicinity. Therefore, the potential for surface fault rupture is low, and this impact is considered *less than significant*.

Ground Shaking

The U.S. Geological Survey (USGS) estimates that there is a 63-percent probability of a strong earthquake (Moment magnitude [Mw] 6.7 or higher)²⁴ occurring in the San Francisco Bay region during the 30-year period between 2007 and 2036 (USGS, 2008). The nearest faults that could cause substantial ground shaking in the project area are the San Andreas fault, located 8 miles west of the project area; the Hayward fault, located 9 miles east; the San Gregorio fault, located within 11 miles; and the Calaveras, Mt. Diablo, and Rodgers Creek faults, located within 21 miles. Based on shaking hazard mapping by

²³ Preconsolidation in this case means that the clay has experienced greater pressure than its current load, and would not be likely to consolidate further unless constructed loads exceeded historic loading.

²⁴ An earthquake is classified by the amount of energy released, expressed as the magnitude of the earthquake. Traditionally, magnitudes have been quantified using the Richter scale. However, seismologists now use a moment magnitude (Mw) scale because it provides a more accurate measurement of the size of major and great earthquakes.

ABAG, the project area would experience violent ground shaking from an earthquake along the peninsula segment of the San Andreas fault and strong ground shaking from an earthquake along the northern Hayward fault, which are the two faults closest to the project area (ABAG, 2012). In addition, the California Geologic Survey (CGS) estimates that peak ground accelerations (expressed in the acceleration due to Earth's gravity in g) within the project area would be 0.48 g (CGS, 2012).²⁵

Although the project area would be subject to strong to violent ground shaking in the event of a major earthquake on either of the two faults identified above, the project would not expose structures to substantial adverse effects related to ground shaking because the new force main would be constructed in conformance with accepted engineering standards, thereby ensuring the new force main would withstand seismic damage from ground shaking. The engineering standards defines seismic sources and the procedure for calculating seismic forces on structures during ground shaking. In addition, the project would not construct habitable structures or introduce additional people to the project area and thus would not expose people to substantial adverse effects related to ground shaking. Therefore, impacts related to ground shaking would be *less than significant*.

Liquefaction, Lateral Spreading, and Earthquake-Induced Settlement

Strong shaking during an earthquake can cause ground failure as a result of soil liquefaction, lateral spreading, and seismically induced densification. The project area is located in an area of potential liquefaction identified by the CGS under the Seismic Hazards Mapping Act of 1990 (CGS, 2001) and an area of very high liquefaction identified by the U.S. Geological Survey (USGS, 2012). The project area is primarily underlain by 10 to 30 feet of loose to medium dense sand to silty sand mixed with gravel, rubble, concrete, brick, glass, and wood; these materials could experience liquefaction and related lateral spreading and seismically induced densification in the event of a major earthquake on one of the regional faults. To address the hazards of liquefaction and related ground failures, the new force main would be constructed in conformance with accepted engineering standards, thereby ensuring that the new force main would withstand seismic damage from liquefaction and related ground failures. Therefore, this impact would be *less than significant*.

²⁵ Acceleration of gravity (g) = 980 centimeters per second squared. Acceleration of 1.0 g is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

Seismically Induced Landslides

The project area is relatively flat and is not located within or near an area of seismically induced landslide susceptibility identified by the CGS under the Seismic Hazards Mapping Act of 1990 (CGS, 2001). Therefore, impacts related to seismically induced landslides are *not applicable* to the proposed project.

Impact GE-2: The proposed project would not result in substantial erosion or loss of topsoil. (Less than Significant)

The project area is primarily built out and covered with impervious surfaces, including streets, sidewalks, a tennis court, and a parking lot. Construction of these features would have entailed removal of any topsoil. Therefore, the project would have *no impact* related to the removal of topsoil.

Soil movement for site preparation and excavation activities could create the potential for wind- and water-borne soil erosion. However, the project area is relatively flat, so substantial erosion would not be expected as a result of these activities. Furthermore, the construction contractor would be required to implement an erosion and sediment control plan for construction activities, in accordance with Article 4.1 of the San Francisco Public Works Code, to address sediment-laden construction-site stormwater runoff, as discussed in Section E.15, Hydrology and Water Quality. The SFPUC must review and approve the erosion and sediment control plan prior to the plan's implementation, and SFPUC would inspect periodically to ensure compliance with the plan. Therefore, impacts related to soil erosion would be *less than significant*.

Impact GE-3: The proposed project would not cause a geologic unit to become unstable as a result of project construction. (Less than Significant)

Ground settlement could result from excavation and shoring installation, construction dewatering, and vibration from construction equipment and activities. Surface heave (the upward movement of soil) could also occur during jet grouting. These potential effects, which could result in unstable soil conditions, are described further below.

SFPUC procedures that address potential unstable soil conditions during construction are stipulated in the construction contract specifications and discussed in Section 3, Project Description. In accordance with the specifications, the SFPUC would require the contractor to design the shoring and dewatering system and the jet-grouted slab to withstand the appropriate ground forces, to minimize settlement

during construction. SFPUC would also require the contractor to hire a qualified instrumentation specialist to install ground settlement monitors and vibration monitors and hire a licensed surveyor to perform baseline surveys to establish baseline conditions. The instrumentation specialist would also be required to perform a pre-construction survey of conditions of existing buildings along the alignment and implement a monitoring program as dictated in the contract specifications.

The maximum allowable settlement on both sides of the excavation during excavation activities would be 0.5 inch at the closest property line and 2.5 inches at three feet from the shoring walls. During pipe ramming activities, the contractor would be required to implement corrective action when settlements reach 0.5-inch and to stop work if settlement reaches 1-inch. Where settlements exceed the specified maximum, the contractor would be required to stop work and notify the CCSF representative. The contractor would then meet with the CCSF representative who may require the contractor to meet with the geotechnical engineer to review monitoring data, and determine the need for corrective measures as necessary.

Corrective actions may include (but would not be limited to) activities such as loosening the soil with an auger prior to operating vibration equipment, reducing the amount of time that vibratory equipment is used, utilizing soil mix columns (blending a cement grout with the in situ soil to form a stable soil column), or modifying existing operations to maintain settlement below the threshold that may cause damage to adjacent facilities. Work would only continue when the CCSF representative and geotechnical engineer approves of the corrective action or deems that corrective action is not necessary. A post-construction survey would be performed by an instrumentation specialist to document the overall settlement along the project alignment.

Excavation

As described in Section B, Project Description, project excavations would extend to 15 to 23 feet below ground surface. The excavations would encounter artificial fill for most of that depth although they could encounter Bay Mud in areas where large mud waves were created by placement of the overlying fill; these mud waves would be found primarily along Spear Street. During excavation, the artificial fill could become unstable, potentially causing settlement of adjacent structures, including buildings, sidewalks, streets, and utilities. Compliance with the construction contract specification requirements for shoring and ground settlement monitoring along with implementation of corrective actions, if needed, would

ensure that impacts related to creation of an unstable geologic unit as a result of excavation or shoring would be *less than significant*.

Construction-Related Dewatering

As discussed above, previous investigations indicate that groundwater is present at approximately 10 to 13 feet below ground surface, which corresponds to elevations of -10 to -13 feet City Datum. However, because of seasonal fluctuations and tides, the groundwater level can be as high as -5 feet City Datum (3 feet above mean sea level). Project excavations would extend to depths 15 to 23 feet below ground surface, well below the water table, and the contractor would be required to maintain groundwater levels approximately 3 feet below the bottom of the excavation to facilitate a dry working area. Although the contractor would be required to use watertight shoring and other methods to reduce groundwater infiltration into the excavated areas, additional dewatering would likely be required to maintain dry working conditions, and this dewatering could result in settlement of the adjacent structures, including buildings, sidewalks, streets, and utilities. Compliance with the construction contract specification requirements for ground settlement monitoring along with implementation of corrective actions, if needed, would ensure that impacts related to creation of an unstable geologic unit as a result of dewatering would be *less than significant*.

Heave as a Result of Jet Grouting

The contractor would jet grout the soil in the excavation sidewalls at the Market Street pedestrian plaza to provide structural support and restrict groundwater inflow into the excavation. Jet grouting could cause surface heave and lateral deformation of the excavation sidewalls. Surface heave could cause the ground to rise several inches, which could adversely affect adjacent structures. Lateral deformation of the excavation sidewalls could cause settlement of adjacent structures, including the pedestrian plaza, Hyatt Regency Hotel, and cable car turnaround. Compliance with the construction contract specification requirements for ground settlement monitoring along with implementation of corrective actions, if needed, would ensure that impacts related to creation of an unstable geologic unit as a result of jet grouting would be *less than significant*.

Vibration from Construction Activities

As discussed in Section E.6, Noise (Impact NO-2), Operation of continuous vibratory equipment such as vibratory compactors, pipe ramming or sheetpile drivers would result in vibration at nearby buildings

and buried utility structures. In certain soil conditions, vibration can lead to liquefaction (or differential settlement in sandy soils), due to the continuous nature of vibration sources like a vibratory pile driver. The American Association of State Highway and Transportation Officials (AASHTO) indicates that “saturated, loose, uniformly or poorly graded sands and silts are sensitive to cyclic vibration such as might be produced by vibratory pile driving. These activities can produce noticeable settlement even at low vibration levels (0.1 to 0.7 in/sec PPV) which are known not to produce threshold cracking” (AASHTO, 2004). Vibratory pile driving generally falls in the range of 3 to 30 Hertz (Hz).

The estimated peak ground acceleration threshold at which differential settlement could occur is about 0.3g for artificial fill (non-engineered), 0.1g for Holocene Dune Sand and 0.2g for Holocene SF Bay Mud (USGS, 2006). The highest risk project construction activity for differential settlement would be continuous vibration from vibratory sheet pile driving, and at 0.1g this corresponds to a threshold of 0.205 in/sec PPV at 30 Hz or 1800 revolutions per minute (rpm). Because portions of the project are located in an area where the soils have a very high susceptibility to differential settlement, project-generated vibration levels at buildings on non-engineered foundations (e.g., slab on grade) or at sensitive buried utility structures (buried structures are weakest at joints or when brittle construction is used, such as clay pipes) could result in differential settlement and associated damage to such structures.

A study conducted in the late 1970s during the sewer outfall construction along the Embarcadero documented settlements from vibratory sheetpile operations at the ground surface within 12 feet of the sheet piles for medium dense sand and settlement at six feet below the ground surface out to about 40 feet in loose sand conditions (Clough et al., 1980). The corresponding ground vibration at a 12 foot distance was about 0.1 to 0.2g (0.3 to 0.6 in/sec PPV at the operating frequency of 1100 rpm, or about 18 Hz) at a test area with medium dense sand, and beyond 12 feet from vibratory sheetpiling, there was very little ground surface settlement. Further, in the immediate area around the sheetpiles (about 5 feet from the trench), the settlement was 1.5 inches or less in areas of medium dense sands. However, in the loose sand area there would be greater settlement. At 40 feet distance the vibration was about 0.003 to 0.005g (0.1 in/sec PPV at 18 Hz) with little or no settlement, and at 20 feet away from the vibratory sheetpiling the subsurface settlement reached 0.5 inch. Since these were subsurface observations, the expectation was that the ground surface settlement was even greater, and since subsurface settlement of several inches occurred at 5 feet from the sheetpiles, the authors expected that the surface above loose sand would settle several inches (Clough et al., 1980). While construction of the proposed project could result in similar effects, compliance with the SFPUC’s contract specification requirements for ground settlement monitoring along with implementation

of corrective actions, if needed, would ensure that impacts related to creation of an unstable geologic unit as a result of vibration-related settlement would be *less than significant*.

Impact GE-4: The proposed project would not create substantial risks to life or property as a result of expansive soil. (Less than Significant)

The project area is immediately underlain by 10 to 30 feet of fill consisting of loose to medium dense sand to silty sand mixed with gravel, rubble, concrete, brick, glass, and wood. This fill generally has low expansion potential. Where project activities might encounter Bay Mud, along Spear Street, the mud is buried at a depth that would restrict expansion of the clays. In addition, the new force main and vaults would be designed according to standard engineering and geotechnical practices for the identification and remediation of expansive soil. Adherence to these requirements would ensure impacts related to expansive soil are *less than significant*.

Impact GE-5: The proposed project does not include a septic system or alternative wastewater disposal system. (Not Applicable)

The proposed project does not include a septic system or alternative wastewater disposal system; therefore, impacts related to soils capable of supporting these systems are *not applicable* to the project.

Impact GE-6: The proposed project would not result in impacts on unique geologic or physical features or alter the topography of the project area. (No Impact)

There are no unique geologic or physical features within the project area. Therefore, there is *no impact* related to changes to unique geologic or physical features or alteration of topography.

Impact C-GE: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not have a significant impact on geology and soils. (Less than Significant)

Geologic impacts resulting from the proposed project are limited to seismic effects and the potential for creation of an unstable geologic unit. Seismic effects could occur in the project vicinity, including the financial district and south of Market area. Therefore, these areas are considered the geographic scope for seismic effects. The creation of unstable geologic units is a local effect; therefore, the geographic scope for this cumulative impact is the project area and immediate vicinity.

Seismic Safety

Several of the nearby projects listed in Table 3 would contribute to an increase in the number of persons potentially exposed to seismic risks in the financial district and south of Market areas, which could result in a potential cumulative seismic safety impact. However, as noted in Impact GE-1, the proposed project would not include the construction of habitable structures or introduce additional people to the project area. In addition, the new force main and vaults would be constructed in accordance with the most current building code requirements for seismic safety. The reasonably foreseeable future projects in the vicinity, which include the 8 Washington Street/Seawall Lot 351 project, would also be built in conformance with the most current building code requirements for seismic safety. These code requirements provide for increased life-safety protection of residents and workers. Therefore, cumulative impacts related to seismic safety would be *less than significant*.

Unstable Geologic Unit

As discussed in Impact GE-3, the proposed project could result in ground settlement from excavation and shoring installation, construction dewatering, from heave during jet grouting, and vibration from construction equipment. The only cumulative project listed in Table 3 that could contribute to cumulative impacts related to an unstable geologic unit is the 8 Washington Street/Seawall Lot 351 project. However, that project is required to comply with accepted engineering standards that address the potential for settlement and subsidence impacts from activities such as excavation, dewatering and pile driving. Those requirements include preparation of a detailed geotechnical report and site specific reports as needed to address the potential settlement and subsidence impacts of construction activities, implementation of a lateral movement and settlement survey to monitor any movement or settlement of surrounding buildings and adjacent streets during construction and monitoring by a Special Inspection, if needed, and implementation of corrective actions as necessary. Similarly, the contractor for the proposed North Shore to Channel Force Main Project would be required to limit ground settlement on both sides of the excavation as specified in the contract specifications, and corrective action would be taken to prevent settlement in excess of these limits. With implementation of these requirements, cumulative impacts related to ground settlement would be *less than significant*.

<i>Topics:</i>	<i>Potentially Significant Impact</i>	<i>Less Than Significant with Mitigation Incorporated</i>	<i>Less-Than- Significant Impact</i>	<i>No Impact</i>	<i>Not Applicable</i>
15. HYDROLOGY AND WATER QUALITY— Would the project:					
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion of siltation on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other authoritative flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact HY-1: The proposed project would not violate water quality standards or otherwise degrade water quality. (Less than Significant)

Construction-Related Stormwater Runoff

Project-related grading and earthmoving operations would expose soil during construction and could result in erosion and excess sediments carried in stormwater runoff to the combined sewer system. In addition, stormwater runoff from temporary on-site use and storage of vehicles, fuels, wastes, and other hazardous materials could carry pollutants to the combined sewer system if proper handling methods were not employed.

However, stormwater drainage during construction would flow to the combined sewer system and would be treated at the SEWPCP, North Point Wet Weather Facility, or other bayside wet weather facilities, described in Section A, Project Setting. Stormwater discharges to the combined sewer system would be subject to the requirements of Article 4.1 of the San Francisco Public Works Code (supplemented by SFDPW Order No. 158170), which incorporates and implements the SFPUC's NPDES permit. To ensure compliance with Article 4.1, the construction contractor would be required to develop and implement an erosion and sediment control plan specifying best management practices and erosion and sediment control measures to control runoff from the construction site. The plan would also include measures for spill prevention and response to minimize the potential for spills of pollutants stored on site. The SFPUC would review and approve the plan prior to implementation and would conduct periodic inspections to ensure compliance. Compliance with these regulatory requirements would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff would be *less than significant*.

Construction-Related Groundwater Dewatering

As noted in Section B, Project Description, previous investigations indicate that groundwater is present at approximately 10 to 13 feet below ground surface which corresponds to elevations of -10 to -13 feet City Datum (Treadwell & Rollo, 2010). However, due to seasonal fluctuations and tides, the groundwater level can be as high as an elevation of -5 feet CCSF Datum (3 feet above sea level). Project excavations would extend to 15 to 23 feet below ground surface, well below the water table, and the contractor would be required to maintain groundwater levels approximately 3 feet below the bottom of excavations to ensure a dry working area. Although the contractor would be required to use watertight shoring and other

methods to reduce groundwater infiltration into the excavated areas, additional dewatering would likely be required to maintain the appropriate groundwater levels.

Groundwater extracted during dewatering would be collected, treated, and discharged to the combined sewer system in accordance with Article 4.1 of the *San Francisco Public Works Code*, as supplemented by Order No. 158170 and the Construction Dewatering Site Discharge Limits of the SEWPCP, which regulates the quantity and quality of discharges to the combined sewer system. The discharge permit would contain appropriate discharge standards and might require installation of meters to measure the volume of the discharge. Although the groundwater could contain contaminants related to past nearby site activities, as discussed in Section E.16, Hazards and Hazardous Materials, and could also contain sediments and suspended solids, the contractor would be required to sample the groundwater prior to storing it in settling tanks equipped with sediment traps and oil/water separators. The stored groundwater would be treated as necessary to meet permit requirements prior to discharge from the tanks. In addition, the contractor would be required to implement a dewatering plan describing the dewatering system and methods for compliance with permit requirements (see Section B, Project Description, for details). The SFPUC would review and approve the plan prior to implementation of dewatering. With discharge to the combined sewer system in accordance with regulatory requirements, water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of groundwater produced during dewatering would be *less than significant*.

Damage to Pre-Existing Wells

The project area is located within the San Francisco Downtown Groundwater Basin, and groundwater from this basin has historically been used for fountains, toilets, irrigation, boiler water, and other non-potable uses (CCSF, 1997b). Therefore, it is possible that historical wells that have not been legally abandoned could be encountered during excavation for the proposed project. If broken during construction, the wells could provide an open conduit to the groundwater, potentially degrading groundwater quality. However, the SFPUC would require the contractor to protect the wellhead and seal during construction, or obtain a well abandonment permit from the San Francisco Department of Public Health (SFPDH) for any wells encountered, and to appropriately abandon the wells. Abandonment would include activities such as drilling out the well and backfilling the resultant space with cement or filling the well with cement which would seal the well and prevent contamination of groundwater. Therefore, water quality impacts related to damage to pre-existing wells would be *less than significant*.

Operation

Following installation of the new force main and vaults, the contractor would backfill excavations and restore the pavement in the affected areas. There would be no change in surface area or drainage patterns, and no new sources of pollutants that would affect stormwater discharges to the combined sewer system. The new North Shore to Channel Force Main would have about the same capacity as the existing North Shore Force Main. Wastewater and stormwater conveyed in the new force main would be treated at the SEWPCP and discharged in accordance with the NPDES permit for the SEWPCP, North Point Wet Weather Facility, and bayside wet weather facilities, as is done under existing conditions. Therefore, there would be *no impact* related to violation of water quality standards or degradation of water quality during operation of the new force main.

Impact HY-2: The proposed project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. (Less than Significant)

The project area is located within the Downtown San Francisco Groundwater Basin, and municipal, domestic, and agricultural supply are listed as existing beneficial uses of this basin (RWQCB, 2010). Dewatering of excavations during construction could temporarily lower groundwater levels in the project vicinity. However, any effects of groundwater dewatering would be temporary, and, once dewatering is completed, groundwater levels would return to normal. In addition, the project does not include the construction of any new impervious surfaces that would interfere with groundwater recharge. Thus, potential impacts related to groundwater depletion are *less than significant*.

Impact HY-3: The proposed project would not alter the existing drainage pattern or create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide a substantial additional source of polluted runoff. (No Impact)

Following installation of the new force main and vaults, the contractor would backfill excavations, restore the pavement in the affected areas, and restore existing drainage patterns. There would be no change in surface area or drainage patterns that would result in flooding, siltation, or erosion, and there would be no change in the quantity or quality of stormwater discharges to the combined sewer system. Therefore, there would be *no impact* related to altering drainage patterns, exceeding the capacity of existing or planned stormwater drainage systems, or providing a substantial additional source of polluted runoff.

Impact HY-4: The proposed project would not place housing within a 100-year flood hazard area. (No Impact)

The proposed project does not include the construction of housing; therefore, there is *no impact* related to placement of housing within a 100-year flood zone.

Impact HY-5: The proposed project would not place structures within a 100-year flood hazard area that would impede or redirect flood flows. (Less than Significant)

The Federal Emergency Management Agency is preparing Flood Insurance Rate Maps (FIRMs) for the CCSF for the first time. FIRMs identify areas that are subject to inundation during a flood that has a 1-percent chance of occurring in a given year (also known as a “base flood,” “100-year flood,” or “1 percent annual chance flood”). The CCSF has requested changes to the preliminary FIRM, including removal of the special flood hazard area from Pier 41 to Pier 50. This area includes the Port piers, wharf structures, and landside improvements protected by these structures (as well as The Embarcadero near the location of the planned vaults) (CCSF, 2007). Pending completion of the federal FIRM for San Francisco, the CCSF has created interim floodplain maps that identify areas of flooding within the city limits. The proposed project area is not within a special hazard flood area or a 100-year flood hazard area on the Interim Flood Plain Map for the northeast portion of San Francisco (CCSF, 2008).

Although the project area is located within an area that would be inundated by flooding associated with an up to 55-inch sea level rise by 2100 (URS Corporation, 2011), the project does not include construction of any aboveground features that would impede or redirect flood flows or be damaged by flooding. Therefore, impacts related to placement of structures within a 100-year flood hazard area are *less than significant*.

Impact HY-6: The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving flooding, including inundation by dam failure, seiche, tsunami, or mudflow. (Less than Significant)

The project area is not in a location subject to reservoir inundation hazards (URS Corporation, 2008) and is not located in a volcanic area that could be subject to mudflow. Therefore, there is *no impact* related to these hazards.

Although the project would be located in an area that could be inundated by a tsunami or seiche (URS, 2008), the project does not include construction of any aboveground features that would be damaged by inundation. The project would not introduce new people to the area, who could be injured or killed in the event of a tsunami or seiche. Therefore, impacts related to inundation by tsunami or seiche are *less than significant*.

Impact C-HY: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not have a significant cumulative impact on hydrology and water quality. (Less than Significant)

Impacts resulting from the proposed project are limited to potential water quality impacts on central San Francisco Bay and adverse effects on groundwater resources of the Downtown Groundwater Basin. Therefore, the geographic scope of potential cumulative impacts on water quality encompasses central San Francisco Bay and the Downtown Groundwater Basin.

Water Quality Standards and Degradation of Water Quality

As described in Impact HY-1, construction activities associated with the North Shore to Channel Force Main Project could degrade water quality as a result of increased soil erosion and associated sedimentation as well as an accidental release of hazardous materials. Discharges of dewatering effluent from excavated areas could also adversely affect water quality. However, these discharges would flow into San Francisco's combined sewer system and would be subject to the requirements of Article 4.1 of the San Francisco Public Works Code (supplemented by SFDPW Order No. 158170), which incorporates and implements the SFPUC's NPDES permit and the federal CSO Control Policy for discharges from the combined sewer system. Because projects listed in Table 3 that would also include discharges to the combined sewer system would be subject to the same regulatory requirements, and adherence to the SFPUC's NPDES permit stipulations would ensure compliance with water quality objectives, cumulative impacts related to degradation of water quality would be *less than significant*.

Depletion of Groundwater Resources

The North Shore to Channel Force Main project and many of the cumulative projects listed in Table 3 would require groundwater dewatering, and groundwater pumping under the proposed project in combination with other groundwater pumping could result in a cumulatively significant impact from the depletion of groundwater resources. However, as discussed in Impact HY-2, the project would not result in the depletion of groundwater resources because any effects of dewatering would be temporary in nature, and groundwater levels would return to normal once dewatering has stopped. Therefore, the North Shore to Channel Force Main project's contribution to cumulative impacts related to groundwater depletion would not be cumulatively considerable (*less than significant*).

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
16. HAZARDS AND HAZARDOUS MATERIALS—					
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Regulatory Setting

Definition of Hazardous Material and Hazardous Waste

Hazardous materials, defined in Section 25501(o) of the California Health and Safety Code, are materials that, because of their “quantity, concentration, or physical or chemical characteristics, pose a significant present or potential hazard to human health and safety or to the environment if released to the workplace or environment.” Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

A waste is any material that is relinquished, recycled, or inherently waste-like. Title 22 of the CCR, Chapter 11 (Identification and Listing of Hazardous Waste) contains regulations for the classification of hazardous wastes (22 CCR 66261.1, et seq.). A waste is considered a hazardous waste if it is toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases) in accordance with the criteria established in Article 3 of Chapter 11. Articles 4 and 4.1 also list specific hazardous wastes and Article 5 identifies specific waste categories, including federal Resource Conservation and Recovery Act (RCRA) hazardous wastes, non-RCRA hazardous wastes, extremely hazardous wastes, hazardous wastes of concern, and special wastes. If improperly handled and if released to the soil, groundwater, or air (in the form of vapors, fumes, or dust), hazardous materials and wastes can result in public health hazards.

City Hazardous Materials Regulations

The following sections of the *San Francisco Health Code*, briefly summarized below, could apply to construction of the proposed project. These include Article 22A (Analyzing the Soil for Hazardous Waste, formerly the Maher Ordinance) and Article 21 (Hazardous Materials).

Under Article 22A, construction of projects located bayward of the historic high tide line that would involve excavation of greater than 50 cubic yards of soil requires preparation of a site history to identify whether past uses might have caused contamination, characterization of on-site soils, and preparation of a site mitigation plan if contamination is identified. The soil analysis report is submitted to the SFDPH, California Department of Toxic Substances Control (DTSC) and RWQCB. The measures recommended in the site mitigation plan must be completed during construction. If hazardous materials remain in the soil or groundwater, SFDPH approval of the site mitigation may be conditioned upon submittal of a Risk Management Plan, Health and Safety Plan, and possibly a Cap Maintenance Plan to prevent exposure to hazardous materials in the soil or groundwater after construction of the project.

Article 21 of the *Health Code* provides for safe handling of hazardous materials in the City. It requires a special permit for removal of underground fuel storage tanks (USTs). (This article also incorporates State of California tank regulations.)

Hazardous Waste Classification

In accordance with Title 22 of the California Code of Regulations (22 CCR) 66261.20, et seq., excavated soil would be classified as a hazardous waste if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity. A waste is considered toxic in accordance with 22 CCR 66261.24 if it contains:

- Total concentrations of certain substances at concentrations greater than the State total threshold limit concentration (TTLC);
- Soluble concentrations greater than the State soluble threshold limit concentration (STLC);
- Soluble concentrations of certain substances greater than federal toxicity regulatory levels using a test method called the toxicity characteristic leaching procedure (TCLP); or
- Specified carcinogenic substances at a single or combined concentration of 0.001 percent.

A waste would be considered hazardous by State and federal regulations if the soluble concentration exceeds the TCLP level as determined by the TCLP method. A waste would also be considered hazardous under State regulations if the soluble concentration of a substance, determined using a Waste Extraction Test, exceeds the STLC. A waste may also be classified as toxic if testing indicates toxicity greater than the specified criteria.

In accordance with California regulations (14 CCR, Chapter 3.5, Article 1), materials containing greater than 1 percent friable asbestos would be considered a hazardous waste and require appropriate disposal.

Environmental Screening Levels

The RWQCB Environmental Screening Levels (ESLs) are guidelines used to evaluate the potential risk associated with chemicals found in soil or groundwater where a release of hazardous materials has occurred (RWQCB, 2008b). ESLs have been established for both residential and commercial/industrial land uses, and also for construction workers. Residential screening levels are the most restrictive; soil with chemical concentrations below these levels generally would not require remediation and would be suitable for unrestricted uses if disposed offsite. Commercial/industrial screening levels are generally higher than residential screening levels because they are based on potential worker exposure to hazardous materials in the soil (and these are generally less than residential exposures). Screening levels for construction workers are also higher than for commercial/industrial workers because construction workers are only exposed to the chemical of concern during the duration of construction, while industrial workers are assumed to be exposed over a working lifetime.

Impact HZ-1: The proposed project would not create a significant hazard through routine transport, use, or disposal of hazardous materials. (Less than Significant)

Construction of the proposed project would involve use of common construction-related hazardous materials: paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel). As described in Section B, Project Description, the SFPUC would require the contractor to prepare an erosion control plan in compliance with Article 4.1 of the San Francisco Public Works Code. The erosion and sediment control plan would specify appropriate methods for storing hazardous materials, preventing spills, inspecting for hazardous conditions, and reporting findings. In addition, transportation of hazardous materials is regulated by the California Highway Patrol and the California Department of Transportation. Implementation of the project erosion and sediment control plan and state regulations for transportation of hazardous materials would ensure project impacts related to the transport, use, and disposal of hazardous materials would be *less than significant*.

Impact HZ-2: Although the proposed project is located adjacent to a site that is included on a list of hazardous materials sites, the proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (Less than Significant)

Contaminants exceeding applicable ESLs have been identified in soil samples collected in the project area, and contaminants may also be present in groundwater. Therefore, during construction, workers and the public could be exposed to hazardous materials from contaminated soil and groundwater. In addition, the contractor could encounter previously unidentified abandoned USTs during construction, and petroleum products could be released from these tanks if they were not properly removed or otherwise abandoned. The subsections below discuss impacts of potential exposure to contaminants from soil, groundwater, and USTs.

Hazardous Materials in Soil

The project would be located bayward of the historic high tide line and would therefore be subject to Article 22A of the *San Francisco Health Code*. This article is implemented by the SFDPH and requires a site history report, and if appropriate, a soil investigation, soil analysis report, site mitigation plan, and certification report to address hazardous materials in the soil, as well as a site health and safety plan.

Site History

A limited environmental site history report was prepared for the proposed project on behalf of the SFPUC (Northgate, 2009a), and included a review of historical aerial photographs, street maps, and Sanborn property insurance maps. Based on this review, portions of Drumm, Spear, and Howard Streets were located in their current positions by 1852, and the site history report concludes most of the fill materials within the new force main alignment were placed between 1851 and 1852.

Based on Sanborn Fire Insurance Maps, the site history report determined that land uses within the new force main alignment have shifted over the past 120 years from industrial and large-scale commercial in the late 1880s to the high-rise commercial and residential uses of today. The site history report also includes an environmental database review to identify known environmental cases in and adjacent to the new force main alignment. The database review report identified 98 leaking underground fuel storage tank (LUST) sites within 0.5 mile of the alignment, seven of which are adjacent to the alignment. Only two of these sites (located at One Market Plaza, and at the Beacon Service Station at 255 The Embarcadero) were considered to have the potential to directly affect soil or groundwater quality within the alignment.

One Market Plaza is a closed LUST site that occupies the city block bordered by Market, Spear, Mission, and Steuart Streets. Remedial actions undertaken at One Market Plaza included removal of separate phase petroleum hydrocarbons when encountered in tank vaults as well as excavation and removal of soil containing hydrocarbons. Excavations were limited by the presence of foundations and utilities near the tank locations. A letter issued by the SFDPH dated October 30, 1996 stated that no further action related to the UST release was required.

The Beacon Service Station at 255 Embarcadero is a closed LUST site adjacent to the northern edge of the new force main alignment. Three 6,000 gallon gasoline USTs and one 500 gallon waste oil UST were removed in 1998. Chemical concentration maps prepared in 2001 show that groundwater isoconcentration contours for 0.10 milligrams per liter (mg/L) total petroleum hydrocarbon as gasoline (TPH-g) and 0.010 mg/L benzene were within 30 to 50 feet of the proposed Vault No. 1 excavation.

As summarized in the limited site history report, information from the environmental database review and personal communication with Stephanie Cushing of the SFDPH Bureau of Environmental Health indicate that no coal gasification plants were historically located on or immediately adjacent to the new force main alignment and that tar waste was not disposed of on or immediately adjacent to the alignment.

Due to the presence of two closed LUST sites near the new force main alignment and the high number of LUST cases near the alignment, there is a high potential to encounter petroleum hydrocarbons and related compounds in soil and/or groundwater within or near the alignment during project construction.

Soil Investigation

A soil investigation conducted in 2009 analyzed samples from 10 borings along the new force main alignment (Northgate, 2009b). Analytical results of the soil samples were compared to the following federal and state hazardous waste criteria: (a) the federal TCLP regulatory level, or (b) the state TTLC and STLC for waste classification purposes. The results were also compared to the San Francisco Bay RWQCB ESLs for a commercial/industrial land use scenario (RWQCB, 2008b), to evaluate potential human health risks from exposure to the soil.

Analysis of the soil samples showed no metals concentrations exceeding the TTLC. However, the soluble level of lead, determined using a waste extraction test, exceeded the STLC of 5.0 mg/L at four boring locations along Drumm Street between Jackson and Market Streets, and on Spear Street south of Market Street. Soluble lead concentrations from these locations ranged from 6.6 to 29 mg/L. None of the soluble lead levels determined using the federal TCLP method exceeded the federal regulatory level of 5.0 mg/L for classification as a hazardous waste under the Resource Conservation and Recovery Act; therefore, the subject soil would be classified as a California hazardous waste only.

The soil analysis report concluded that soil excavated from the segment of the alignment represented by borings SB-2, SB-4, SB-5, and SB-6 (on Drumm Street from the midpoint between Jackson Street and Washington Street to the midpoint between Washington Street and Clay Street, and from the intersection of Drumm Street and Clay Street to Spear Street between Market and Mission Streets) should be considered a California hazardous waste and disposed of at a Class I disposal facility. The remainder of the excavated soil would not be a California hazardous waste but would require disposal at a Class II disposal facility. The report included waste acceptance letters from Kettleman Hills, a Class I disposal facility for hazardous wastes, and Altamont Landfill, a Class II disposal facility.

Arsenic concentrations ranged from not detected to 9.1 milligrams per kilogram (mg/kg); all of the detected concentrations exceeded the RWQCB ESL of 1.6 mg/kg for a commercial/industrial land use scenario. Copper concentrations ranged from not detected to 320 mg/kg; only the highest concentration exceeded the RWQCB ESL of 225 mg/kg for a commercial/industrial land use scenario. Polychlorinated biphenyls (PCBs), semi-volatile organic compounds, volatile organic compounds, cyanide, and asbestos

were not detected in the soil samples. The detected concentrations of total recoverable petroleum hydrocarbons ranged from 80 to 510 mg/kg. All samples were negative for reactivity, corrosivity, and ignitability.

Site Mitigation Plan

The project site mitigation plan (Northgate, 2009c) specifies disposal protocols for the soil excavated from the alignment in accordance with the classifications determined by the site investigation. In addition, the site mitigation plan specifies that dust control practices shall be implemented to reduce public and worker exposure to contaminated dust during construction. Dust control measures include wetting surface soils and soil stockpiles during excavation and soil handling operations, loading, and transport; minimizing drop-off distances; equipping trucks with tarpaulin covers for off-site transport; covering stockpiles when not in use; and implementing additional dust control measures as needed. In accordance with the site mitigation plan, additional dust control measures would be needed if visible dust was observed in the workers' breathing zone or leaving the work site. In addition, soil stockpiles must be protected from public access, and waste transporters would have to be licensed and permitted to carry the appropriate waste classification.

Article 22A Compliance

The SFDPH reviewed the site history report, soil investigation report, and site mitigation plan for the project and concluded that the reports and plan meet the requirements of Article 22A. SFDPH required that a site safety plan be submitted 2 weeks prior to the start of construction and that a final report (certification report) be submitted upon completion of the project (SFDPH, 2009). Compliance with Article 22A requirements, including implementation of the approved site mitigation plan and required health and safety plan, would ensure impacts associated with exposure to hazardous materials in the soil would be *less than significant*.

Hazardous Materials in Groundwater

As noted in Section 15, Hydrology and Water Quality, previous investigations indicate that groundwater is present at approximately 10 to 13 feet below ground surface, which corresponds to elevations of -10 to -13 feet City Datum (Treadwell & Rollo, 2010). However, because of seasonal fluctuations and tides, the groundwater level can be as high as 5 feet below ground surface (an elevation of -5 feet CCSF Datum or 3 feet above sea level). Project excavations would extend 15 to 23 feet below ground surface, well below

the water table, and the contractor would be required to maintain groundwater levels approximately 3 feet below the bottom of excavations to ensure a dry working area. Although the contractor would be required to use watertight shoring and other methods to reduce groundwater infiltration into the excavated areas, additional dewatering would likely be required to maintain groundwater levels necessary for construction and force main installation.

Groundwater extracted during construction dewatering would be discharged to the combined sewer system, in compliance with Article 4.1 of the *San Francisco Public Works Code*, as supplemented by Order No. 158170, which specifies conditions and criteria for discharge of groundwater. The above-referenced site investigation (Northgate, 2009b) included groundwater sampling to determine compliance with the discharge limits specified in Article 4.1 and Order No. 158170 (Northgate, 2009b). Semi-volatile organic compounds, PCBs, and total oil and grease were not detected in the groundwater samples analyzed. The detected concentrations of dissolved metals and volatile organic compounds did not exceed discharge limits.

Article 4.1 also prohibits discharge of hazardous wastes into the combined sewer system. The contractor would be required to sample the groundwater prior to storing it in settling tanks equipped with sediment traps and oil/water separators. Prior to discharge from the tanks, the stored groundwater would be treated as necessary to meet permit requirements. In addition, as described in Section B, Project Description, the contractor would be required to implement a dewatering plan describing the dewatering system and methods for complying with permit requirements. The SFPUC Wastewater Enterprise Collection System Division would review and approve the plan prior to implementation of dewatering. With discharge to the combined sewer system in accordance with regulatory requirements, hazardous materials impacts related to discharge of groundwater produced during dewatering would be *less than significant*.

Previously Unidentified Underground Storage Tanks

If a previously unidentified UST that is abandoned or no longer in use is encountered during construction, the SFPUC would require the construction contractor to close the tank in accordance with Article 21 of the *San Francisco Health Code*. A closure plan, identifying appropriate requirements for disposition of any remaining hazardous materials in the tank as well as of the tank itself, would be submitted to the SFDPH for approval prior to removal of the UST. Soil from the UST excavation would be sampled in accordance with Article 21, and groundwater could be required to be sampled as well.

Once tank closure is complete, a release or contamination report would be submitted to SFDPH if such a report is determined necessary by the SFDPH based on visual observations or sampling during tank removal by the removal contractor and/or SFDPH inspector. A final report documenting tank removal activities and any residual contamination would also be submitted to the SFDPH. After approving this report, SFDPH would issue a Certificate of Completion. If there was evidence of a release of hazardous materials, the SFPUC would submit a corrective action plan, including a community health and safety plan, to SFDPH and RWQCB, and remediation would be required. Alternatively, the tank could be abandoned in place by a method such as filling it with concrete if removal is infeasible. With implementation of UST closure or abandonment procedures in accordance with regulatory requirements, hazardous materials impacts related to the potential to encounter a previously unidentified UST would be *less than significant*.

Impact HZ-3: The proposed project would not release hazardous emissions or handle acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school. (Less than Significant)

Several day care centers are located within 1,000 feet of the project area including Bright Horizons, Marin Day School-Hill Plaza, Marin Day School-Spear Street, and Pacific Gas and Electric Children's Center (Environ, 2012). School children were also identified at Youth Chance High School. The State of California defines extremely hazardous materials in Section 25532 (2)(g) of the Health and Safety Code. Construction of the proposed project would use only common hazardous materials: paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel). None of these materials is considered extremely hazardous. The CARB and the BAAQMD have identified toxic air contaminants that constitute hazardous air emissions. Project construction or operation would not use extremely hazardous materials as identified by the CARB and BAAQMD, and project operation would not emit toxic air contaminants (impacts related to the release of diesel particulate matter during construction are addressed in Section E.7, Air Quality). Thus, impacts related to hazardous emissions or the use of extremely hazardous materials within ¼ mile of a school would be *less than significant*.

Impact HZ-4: The proposed project would not be located within an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private air strip. (Not Applicable)

The nearest airports to the project area are San Francisco International Airport approximately 11 miles to the south and Oakland International Airport approximately 11 miles to the southeast. Therefore, impacts

related to location within an airport land use plan, within 2 miles of a public airport, and in the vicinity of a private air strip are *not applicable*.

Impact HZ-5: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

As discussed in Section B, Project Description, the southbound peak-period lane, bicycle lane, and one southbound traffic lane on The Embarcadero would be closed for up to 5-weeks during construction of Vault No. 1 and installation of road decking. Once in place, the road decking would provide two lanes of traffic above the vault excavation during construction, but the peak-period and bike lanes would be closed for the remainder of the 3-month construction period. Construction of Vault No. 2 would likely require temporary closure of the southbound peak-period and bike lanes as well as the sidewalk on The Embarcadero for up to 2 months. In addition, one parking lane and one traffic lane on Drumm, Spear, and Howard Streets would be closed during force main installation. During construction, local access for emergency vehicles would be maintained along the new force main alignment.

There are no police or fire stations, schools, or hospitals within or adjacent to the project alignment, so the project would not interfere with access to these facilities. As discussed in Section E.5, Transportation and Circulation, the proposed lane closures along The Embarcadero, and Drumm, Steuart and Howard Streets could slow, but would not prevent, emergency vehicle access in the immediate area of construction. Impacts related to impairment or interference with an adopted emergency response plan or emergency evacuation plan would be less than significant because the traffic control plan prepared for the project (subject to approval by the SFMTA) would give emergency vehicles (police, fire, and ambulance) access priority during the lane closure period. Further, emergency vehicles traveling southbound on The Embarcadero would be able to use the streetcar exclusive right-of-way located in the median. In addition, the traffic control plan would require written notification to all emergency service providers prior to street closures, and detour signs and flaggers would be in place during the lane closure periods.

Once construction is complete, vehicular access on the affected streets would be restored, and there would be no changes to the street network. Therefore, no permanent impact related to impairment or interference with an adopted emergency response plan or emergency evacuation plan would occur.

Impact HZ-6: The proposed project would not expose people or structures to a significant risk of loss, injury or death involving fires. (Less than Significant)

As discussed in Section B, Project Description, the proposed project would be constructed within existing streets and utility corridors in the financial district and south of Market areas of San Francisco. This area is not classified as a high or very high wildfire hazard area (URS, 2008). Further, as described in Section E.5, Transportation and Circulation, emergency vehicles would have local access along the project alignment during construction and there would be no loss of water service for fire response. Therefore, impacts related to exposure of people to risk of loss, injury, or death involving fires are *less than significant*.

Impact C-HZ: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not have a significant impact related to hazards and hazardous materials. (Less than Significant)

Hazardous materials impacts related to the project could result from use of hazardous materials during construction and conducting construction activities within contaminated soil and groundwater. These impacts would be primarily restricted to the project area and immediate vicinity; therefore, the geographic scope for cumulative impacts related to hazards includes the project area and immediate vicinity.

As discussed in Impact HZ-1, the proposed project would use common construction-related hazardous materials. Several other projects listed in Table 3, including the adjacent 8 Washington Street/Seawall Lot 351 project, would also use hazardous materials during construction. However, as discussed in Impact HZ-1, the contractor would be required to implement an erosion control plan, subject to SFPUC approval, that would specify appropriate methods for storing hazardous materials, preventing spills, inspecting for hazardous conditions, and reporting. Because the potentially cumulative projects listed in Table 3 would be subject to these same requirements, cumulative impacts related to use of hazardous materials during construction would be *less than significant*.

As discussed in Impact HZ-2, the proposed project is located bayward of the historic high tide line. Project construction would disturb contaminated soil and groundwater and could also require closure of any USTs encountered during construction. Several of the other projects listed in Table 3, including the adjacent 8 Washington Street/Seawall Lot 351 project, would also be located bayward of the high tide line and could encounter contaminated soil and groundwater or previously unidentified USTs. However, the proposed project and other projects located bayward of the high tide line would be required to comply with

applicable regulations for UST closure specified in Article 21 of the *San Francisco Health Code* and with Article 22A of the *San Francisco Health Code* requiring soil investigation and a soil analysis report, site mitigation plan, and certification report along with a site health and safety plan. Therefore, cumulative impacts related to construction in contaminated soil and groundwater and closure of USTs would be *less than significant*.

As discussed in Impact HZ-5, the project would not impair or interfere with an adopted emergency response plan or emergency evacuation plan because the traffic control plan prepared for the project would give emergency vehicles (police, fire, and ambulance) access priority during the lane closure period; emergency vehicles traveling southbound on The Embarcadero would be able to use the streetcar exclusive right-of-way located in the median; and the traffic control plan would require written notification to all emergency service providers prior to street closures, and detour signs and flaggers would be in place during the lane closure periods. Because the other projects listed in Table 3, including the adjacent 8 Washington Street/Seawall Lot 351 project, would also be required to implement similar traffic controls pursuant to a traffic control plan approved by the SFMTA, cumulative impacts related to impairment or interference with an adopted emergency response plan or emergency evacuation plan would be *less than significant*.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
17. MINERAL AND ENERGY RESOURCES— Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact ME-1: The proposed project would not result in the loss of availability of a known mineral resource or a locally important mineral resource recovery site. (No Impact)

All land in San Francisco, including the project area, is designated Mineral Resource Zone 4 (MRZ-4) by the CGS (formerly the California Division of Mines and Geology) under the Surface Mining and Reclamation Act of 1975 (CDC, 1996). This designation indicates there is inadequate information available for assignment to any other MRZ; thus, the project area is not a designated area of significant mineral deposits. The new force main would be constructed primarily in fill material rather than native geologic formations within existing streets and utility corridors within and adjacent to a high-density residential-commercial combined district, public use district, and downtown office and commercial districts. There are no operational mineral resource recovery sites in the project area whose operations or accessibility would be affected by construction or operation of the proposed project. Thus, the project would have *no impact* related to the loss of availability of a locally or regionally important mineral resource.

Impact ME-2: The proposed project would not encourage activities that would result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner. (Less than Significant)

Construction of the proposed project would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, pipeline installation, vault construction, and vehicle travel. Fuel use for construction worker commute trips would be minor in comparison to the fuel used by construction equipment and for hauling. Construction-related energy consumption cannot be precisely predicted. However, wasteful use of fuels during construction would not be economically sustainable for contractors. With respect to water usage, construction of the proposed facilities would require some water use for dust control and other purposes but reclaimed water must be used for dust control as required by Article 21, Section 1100 et seq. of the San Francisco Public Works Code, and the project would not involve the wasteful use of water or encourage activities that use large amounts of water. Therefore impacts related to the use of fuel, water, and energy during construction would be *less than significant*.

The new force main would have about the same capacity as the existing force main and would not increase sewage handling requirements. Although slightly more energy could be required to operate the new force main because of its longer length and greater number of bends, this energy would not be used in a wasteful manner and operation of the pipeline would not require the use of fuel or water. Therefore, impacts related to the use of fuel, water, and energy during project operations would be *less than significant*.

Impact C-ME: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the vicinity, would not have a significant impact on mineral and energy resources. (Less than Significant)

The geographic scope for potential cumulative energy resources impacts consists of the project vicinity and the broader region.

The proposed project would use energy during construction, as would all of the cumulative projects listed in Table 3 and other projects in the region, and the project in combination with the other reasonably foreseeable projects could result in a potentially significant cumulative energy impact during construction. However, as described in Impact ME-2, the proposed project would not result in the wasteful consumption of fuels during project construction. Therefore, the project's contribution to cumulative impacts related to energy use during construction would not be cumulatively considerable (*less than significant*).

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less-Than- Significant Impact	No Impact	Not Applicable
18. AGRICULTURE AND FOREST RESOURCES—					
Would the project					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)) or timberland (as defined by Public Resources Code Section 4526)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Impact AF-1: The proposed project would not result in the conversion of farmland or forest land to non-farm or non-forest use, nor would it conflict with existing agricultural or forest use or zoning. (No Impact)

The project area is located in CCSF, entirely within a public-right-of-way and developed land. The California Department of Conservation's (CDC's) Farmland Mapping and Monitoring Program identifies the project area as Urban and Built-Up Land, which is defined as "... land [that] is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes" (CDC, 2010). Because the project site does not contain agricultural uses and is not zoned for such uses, the proposed project would not convert any prime farmland, unique farmland, or Farmland of Statewide Importance to non-agricultural use, and it would not conflict with existing zoning for agricultural uses or a Williamson Act contract. Likewise, because the project site does not contain forest land and is not zoned for forest uses, the North Shore to Channel Force Main Project would not result in the loss of forest land, the conversion of forest land to non-forest uses, and it would not conflict with existing zoning for or cause rezoning of forest land or timberland. Therefore, the proposed project would have *no impact* on agricultural or forest resources.

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
19. MANDATORY FINDINGS OF SIGNIFICANCE—Would the project:					
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have impacts that would be individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Topics:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Not Applicable
c) Have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Impact MF-1: The proposed project could degrade the quality of the environment, reduce the habitat of a fish or wildlife species, or otherwise adversely affect a rare or endangered plant or animal species. (Less than Significant with Mitigation)

As discussed in Impacts BI-1 and BI-2, the project area and immediate surroundings are composed solely of hardscape and landscape vegetation, and no native vegetation is present. Therefore, the project would not adversely affect the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, or threaten to eliminate a plant or animal community.

Native nesting birds could be adversely affected by removal of one Brazilian pepper tree and one London plane tree during construction as discussed in Impact BI-3, impacts on the nesting birds would be less than significant with implementation of **Mitigation Measure M-BI-4, Protection of Active Nests**, requiring netting of trees prior to the nesting season to prevent nesting or surveys to determine the absence or presence of nests if netting is not in place prior to the nesting season and tree removal is conducted during the nesting season. With implementation of this mitigation measure, impacts related to reducing the number or restricting the range of a rare or endangered plant or animal would be less than significant.

Impact MF-2: The proposed project could eliminate important examples of the major periods of California history or prehistory. (Less than Significant with Mitigation)

As discussed in Impact CP-1, the Rincon Center at 121 Spear Street is a Historic Landmark pursuant to Article 10 of the CCSF Planning Code and the Southern Pacific Building at One Market is a potential historic resource. Vibration-related damage to these buildings could adversely affect an important example of California history. However, this impact would be reduced to a less-than-significant level with implementation of **Mitigation Measure M-CP-1, Construction Monitoring Program for Historic Resources**, which would require the SFPUC to implement a monitoring program to minimize damage to adjacent historic buildings.

As discussed in Impact CP-2, construction activities associated with the proposed project could result in adverse effects on the remains of a Gold Rush-period ship known as the *Henry* and the Gold Rush-period Commercial Street Wharf. However, with implementation of Mitigation Measures M-CP-2a, **Accidental Discovery of Archaeological Resources** and M-CP-2b, **Archaeological Resource Monitoring**, these potentially important examples of California history, if encountered, would be recovered or protected rather than eliminated. Therefore, impacts related to elimination of important examples of major periods of California history or prehistory are *less than significant with mitigation*.

Impact MF-3: The proposed project could have impacts that would be individually limited, but cumulatively considerable. However, the project's contribution to these cumulative impacts would be less than significant or less than significant with implementation of the mitigation measures described herein. (Less than Significant with Mitigation)

Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of the project when added to those of other closely related past, present, or reasonably foreseeable future projects.

The cumulative analysis for individual topic areas is included in Sections E.1 through E.18. In accordance with CEQA Guidelines, Section 15130(b)(1), these analyses are based on the list of past, present, and probable future projects presented in Table 3; the projects listed in combination with the proposed project could result in related or cumulative impacts due to their location and/or construction schedule.

As discussed in the individual topic areas in Sections E.1 through E.18, the proposed project could contribute to cumulative construction-related impacts. However, for the reasons described in Sections E.1 through E.18, including implementation of project-level mitigation measures, the project's contribution to all cumulative impacts would not be cumulatively considerable (*less than significant*).

Impact MF-4: The proposed project could have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. (Less than Significant with Mitigation)

The proposed project construction activities would result in impacts with adverse effects on human beings, including those related to noise and air quality. However, with implementation of the mitigation measures specified in Sections E.1 through E.18, all direct and indirect environmental impacts of the project would be reduced to less-than-significant levels.

F. NEIGHBORHOOD NOTICE AND PUBLIC OUTREACH

A "Notification of Project Receiving Environmental Review" was distributed on January 4, 2012, to the owners of properties within 300 feet of the project alignment as well as to other interested parties. The Planning Department received three emails in response to the notice. Respondents requested to receive further environmental review documents and asked about the relationship of the proposed project to the 8 Washington Street/Seawall Lot 351 project; provided information regarding potential conflicts with activities at the Gateway at 440 Davis Court; requested that the PMND appropriately consider the project's effects on traffic, parking, and access to the Ferry Building and nearby recreational uses; and requested that the PMND address the cumulative effects of the proposed project with other projects in the area. The relationship of the proposed project to the 8 Washington Street/Seawall Lot 351 project and potential cumulative effects of the project with other projects in the area are addressed in the cumulative impact analyses provided in Sections E.1 through E.18. Conflicts with operations at the Gateway as well as traffic, parking, and access to the Ferry Building and nearby recreational uses are addressed in Section E.5, Transportation and Circulation.

In addition to circulating the Neighborhood Notice, the SFPUC has also developed a Public Outreach Plan for the North Shore to Channel Force Main project. The public outreach goals are to: enhance public understanding of the construction work and provide timely and adequate responses to public issues that arise from the construction work. The plan includes coordination with various CCSF departments such as SFPDW, SFMTA, and the Mayor's Office of Economic and Workforce Development (with regard to the America's Cup project), and also outlines coordination with residential and commercial parties and associations along the alignment including the media both prior to construction and during construction.

The SFPUC project manager and public outreach liaison have been coordinating with representatives of the commercial and residential building complexes on the project alignment through conducting one-on-one meetings prior to construction. These efforts are above and beyond the CEQA process, where SFPUC provides project information, addresses concerns in advance, and collects project-pertinent information (feedback) from stakeholders. The feedback received from the stakeholders at these meetings will be incorporated into the construction project to help minimize construction impacts in the project area. As of January 31, 2012, SFPUC has contacted all of the property owners and met with approximately 80 percent of the owners/property managers in the project alignment.

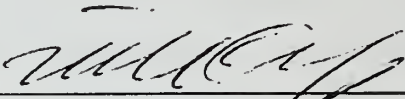
G. DETERMINATION

On the basis of this initial study:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

DATE

February 27, 2011



Bill Wycko

Environmental Review Officer

for

John Rahaim

Director of Planning

H. REFERENCES

The documents listed below are available for review at the Planning Department, 1650 Mission Street, Suite 400, Case File No. 2011.1370E.

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